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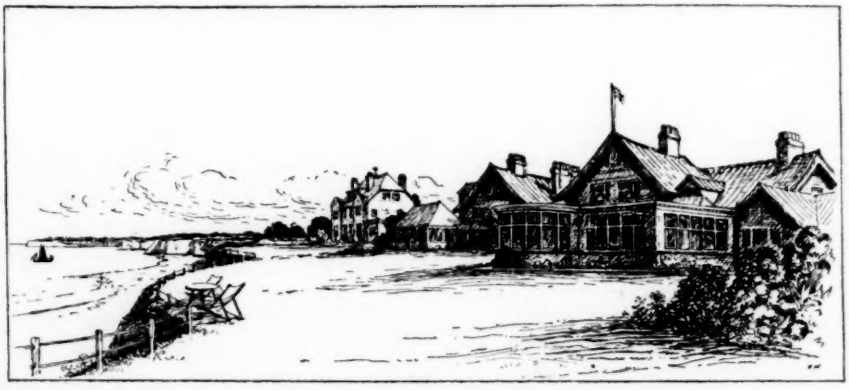

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WE are opening to-night a session of no ordinary importance, in that during its course this Society will celebrate its 150th anniversary. And may I here say how honoured I feel to be your President during this year, how deeply I value the confidence which your selection of me denotes, and how it will be a "labour of love" to try to serve you well. I shall be encouraged by the example of my distinguished predecessor in the chair, a surgeon in whom the thinker is not lost in the excellence of the technician, and whose wide culture and sympathetic personality give him a wide circle of friends.

THE MEDICAL SOCIETY OF LONDON.

This Society was born at a time of change; an old order in civilisation was passing, the forces were gathering which were soon to culminate in the War of Independence—that mighty instrument of liberty which not only brought about the birth of a nation but gave to Britain by its influence a peaceable progression towards the freedom which was to mature in the ensuing century. The life of this Society has corresponded with a period of almost unexampled expansion. Thus, in 1782, London had a population of 650,845, and contained 774 doctors; the College of Physicians consisted of 43 Fellows and 74 Licentiates.[1] There were no medical schools then, and beyond the training of apprentices facilities for medical instruction consisted of detached efforts by enthusiastic teachers; such lectures were as often given in private houses as in hospitals. The doctors' residences were extending beyond the City to the *then* West End, and were exemplified by such addresses as Essex-street, Strand (it was there Dr. Fordyce, of St. Thomas's Hospital, lectured), Craven-street, Leicester-street, Haymarket. There was no concentration of doctors as in the Harley-street area, and in that respect, perhaps, our forefathers were wiser than we are. But this Society, being full of youthful vigour, finds more interest in prospect than retrospect, and I have ventured to think that certain tendencies or developments in the art of medicine to-day might be worthy of your consideration. If I restrict myself to a few of these I hope you will put it down to regard for the exigencies of time and of your patience rather than to narrowness of the speaker's outlook.

THE CAUSES OF DEVELOPMENT.

Developments in the art of medicine are due to—First, the extension of clinical knowledge. Secondly, the increasing number and range of the sciences on which the art of medicine is based; to mention these sciences here would be needless, their name will soon be legion. As examples, I may refer on the physical side to biochemistry and on the mental side to psychology. Both of these are making strong claims on our attention—the former in quietude and the latter amidst the noise of the market-place. In passing, I may say that this extending range of medicine makes so big a claim on its devotees as to tend to draw them from contact with the humanities and produce the danger of exclusiveness.

Thirdly, in changes in the environment and life of the people. New knowledge brings benefits but, at the same time, difficulties of its own. Through modern agencies like the newspapers and the cinema, and now broadcasting, man's mind is being supplied with a restless stream of impressions which must work into and alter the texture of his mind, especially in youth. We cannot add to the speed and stress of life, as this age is increasingly doing, without modifying man's behaviour in health and illness. People are kept at high tension, sometimes as much by their pleasures as by their work; and relaxation becomes a stranger to them, and with the oncoming of wireless telephony and aviation our last hope of peace is going. You are on your way to a consultation, say, at Northwood or Walton Heath, having left suitable messages at home, and, behold, you are rung up in your car on your wireless telephone to say that a patient is arriving from Aberdeen by aeroplane and has to be back at business by the following morning! No escape. These developments disturb life. It is a curious omission that no operation has yet taken place in an aeroplane! The career of the appendix would be incomplete without it. A cinema operator would have by chance to be one of the passengers.

Growing Complexity of the Clinical Picture.

It results that mind plays a larger part in the causation of disease than in the past; that not only are neuroses more common but in bodily illness mental symptoms are more often blended with the physical in the clinical picture. What I may style clinical values have changed. Even in organic disease there is commonly a superstructure of neurosis, which is apt to obscure the view. There are, in short, the symptoms more directly produced by the morbid process and the symptoms produced by the patient, and the latter may at times be the more prominent. As a matter of experience, physicians would, I think, agree that clinical pictures have become more complex, their features more difficult to distinguish and estimate than formerly. And doctors often tell me that in their practices text-book pictures of disease are less and less common. Take that interesting condition, high blood pressure. In its early stage—the curable one—it is often a mental not a bodily defect. Note the sensitiveness, anxiousness, conscientiousness—all defects of qualities, leading to tenseness of expression and then prematurely to set lines of feature; note also the increased tonicity of the muscles with a growing inability to relax them—an inability which will later extend to the hours of sleep.

In our rapid, complex social life exhaustion is not only the direct cause of much disability but its effects colour and complicate the clinical pictures of many diseases. In its manifestations, derangements of body and mind are found in close apposition and interaction. For instance, a tired professional man complains of pains in the heart or dyspepsia. Like many tired people he is hypersensitive, and has therefore become over-responsive to the workings of his own vital processes as well as to the jars of the world outside. He becomes introspective, then possessed of anxiety, and interprets his symptoms in terms of his fears; there follow preoccupation, failure of attention, ineffectiveness in work, loss of confidence, depression, self-depreciation, and so step by step into the zone of danger.

This blending of the physical and mental is again illustrated by certain gastro-intestinal troubles. The patient is usually a spare subject, with keenness and sensibility but without proportionate strength; he goes through life "all out," has a shallow frame, a low blood pressure, easily-chilled extremities, and an over-responsive abdomen which reacts to every blast of vain doctrine. What are you to call a complex like this? You must label it by one of its features. Thank heaven for "colitis," but pity the poor statistician. The suprarenal may here be the link—perhaps the "transformer" between mental and physical.

The grades and variants are manifold. Such features and factors enter more and more into the causes and manifestations of the illnesses of a modern community. It follows, therefore (and this is my first plea), that they should not be pushed aside under the general label of neurotic, nor should they be the

[1] Medicine in England during the Reign of George III., by Arnold Chaplin.

exclusive concern of specialists. Rather should they be studied and taught upon in our hospital clinics and as they exist, symptoms of mind side by side with symptoms of body.

MEDICINE AND EDUCATION.

These problems which the practitioner has to tackle demand in a special degree the insight and discrimination which come from a bedside training and sympathetic contact with the sick, for the latter have sometimes difficulty in defining their symptoms and have to be understood rather than unduly questioned. Or again, symptoms which may be irrelevant to the immediate physical diagnosis (shall I say the affixing of the label?) may yet be of great moment in that they loom large in the mind of the patient; perhaps they have roots in doubts and fears running far back into the patient's life, and need to be perceived, understood, and explained and thereby dispersed, so that the patient's mind can be given content and confidence and so reinforce the vital powers which bring about healing. It is this which Goodhart—always perceptive and illuminating—had in mind when speaking of the "Common Neurosis." "There are many conditions in which the cure must come mainly from within, our function in chief being to call out this dormant power."

The power to penetrate the patient's mind, to help that mind to unfold and to perceive where the burden presses most heavily—all that is part of diagnosis. The resulting confidence and inspiration in the patient's mind are part of treatment. It is interesting to reflect how in this, as in other respects, the arts of medicine and education are approximating. The personality of the school child is perceived and understood and thus encouraged to unfold; it is led to discipline itself rather than have discipline thrust upon it.

In its wider conception treatment is educational, and in the formation of health the territories of medicine and education overlap. Mind-training more and more needs to be a prominent aim of both medicine and education, in order that people may be equipped to deal with the feverishness of their environment. We have physical culture and training established as a valuable asset of curative and preventive medicine. We now need to give a corresponding place to psychical training. There are in existence the beginnings of such treatment—detached efforts such as relaxation exercises and other measures dependent on the application of rhythm, training in mental detachment, &c. But they need developing and methodising, and I suggest that the profession should do this work instead of leaving it to worthy though irresponsible people outside.

THE NEWER PSYCHOLOGY.

These purposes of medical treatment are not new; they have always belonged to the English school of thought, but they have been rather eclipsed these later days by progress in the objective methods afforded by radiography, chemistry, surgery, &c. It is curious that they should recede into the background at the very time when the conditions of life make their need the greater; my plea is that medicine, if it is to fulfil its work, must take mind phenomena more closely into its study and keeping. At the present time they are occupying the public mind too much and the professional mind too little. The newer psychology is accepted with seriousness, almost with fervour, by widening circles of the laity and by a group of medical specialists; but at present it is regarded with doubt, if not with aversion, by the bulk of the medical profession. At the discussion on psychotherapy at the Joint Section of Neurology and Psychological Medicine during the recent meeting of the British Medical Association at Glasgow, physicians attached to hospitals took no part.

And is this attitude of mind to be wondered at? What has happened in the past? What is happening now? No sooner does a truth crystallise from honest thinking than it is obscured by encrustations of credulity, assertion, mysticism, and even fraud. Honest exponents drift with fatal facility into exaggerated claims and pretentions and a superstructure of falsity soon overshadows the foundations of truth, and prejudice rather than conviction is the result. The way in which all sorts and conditions of people without scientific training or medical knowledge not only discuss but seek to apply analytical psychology would be ludicrous if it were not so dangerous. And yet psycho-pathology is a serious science, with a real and useful application to medicine; is giving order and direction to methods which were empirical and haphazard. If given a wider recognition and consideration within the fold of medicine, where it would be subjected to restraints and controls, it would "speak forth the words of truth and soberness," and enrich the theory and practice of medicine.

Over psycho-analysis there is much misapprehension. The term comprises (1) the theory of the working of the unconscious mind, and (2) the practice whereby the unconscious mind can be explored. Strictly the term should be limited to the particular theory and practice set forth by Freud and his immediate disciples. Many exponents, though accepting the basis of Freud's teaching, have departed from some of his tenets and methods, seeking to distinguish their work by the term "Analytical Psychology." They none the less are saddled by their critics with full responsibility for Freud's teaching, including his view that morbid and repressed complexes are associated with primitive sex impulses.

Psycho-analysis: Theory and Practice.

Though discussion of psycho-analysis is obviously beyond our purpose to-night, it is worth briefly considering the ways and means of its presentation and handling; for I venture to think that therein is to be found the explanation of the heavy weather it is encountering. And here a sharp distinction must be made between its theory and its practice.

A theory or hypothesis put forward by a brilliant thinker, and supported by a wealth of investigation, cannot fail to enrich knowledge and be for the benefit of mankind, irrespective of its truth or falsity, provided it is expounded by those who are fitted to do so—which means, in the case of psycho-analysis, trained workers drawn from the ranks of psychologists, medical men, and educationists; surely it is widely accepted that the theory of the unconscious mind is a great work likely to exercise influence both on medicine and education. But if, as has happened here, all sorts and conditions of people delve into the subject, confusion of thought and disturbance of mind must result.

And when it comes to the *practice* of psycho-analysis a much more serious position arises. Here we are dealing with a highly specialised method of diagnosis and treatment, which it cannot be said is without effect, either for good or evil or both, on the patient. It must often be an exploratory operation on the mind, and if you do not accomplish good, you are not sure the result is negative. You cannot feel the same assurance—as in an exploratory operation on the body—that at least no damage is done. The mind does not always heal by first intention. May not baneful influences thereby gain entry? Admitting that psycho-analytic treatment has its sphere of usefulness, under conditions of such complexity it is the habit in our profession for the treatment to be undertaken only by workers with specialised training—which ensures skill, restraint, and good judgment (this has been emphasised in a recent paper by Dr. Crichton Miller). Can it be said that these conditions are fulfilled in the practice of psycho-analysis? I fear not, and therein lies legitimate cause for criticism and alarm.

Too many of its practitioners are fanatics, who see not either limitations or disadvantages and have no eyes for anything outside their narrow cult. This is unfair on competent and serious workers, who are thereby misrepresented, as has recently been illustrated by the joint conference of psychologists and educationists at the recent meeting of the British Association at Hull.

I will briefly suggest reasons why psycho-analytic treatment calls for special caution. Its duration is both long and uncertain, extending it may be into months

and even years. This is a great strain on the mind of the patient, who lives with a quickening sense of his own abnormality, and if the treatment does not suit him the danger of doing him damage is intensified. The operator (analyst) cannot control with precision the range of his operation; beyond the happenings he wishes to induce, others may result which are unsought and detrimental. Psycho-analysis induces and aggravates introspection and is apt to produce morbid ideas. The laying bare of the unconscious mind—both the process and the result—injures some sensitive subjects and does harm by debasing them in their own estimation. The dominant position asserted for primitive sex impulses in the causation of repressions aggravates the difficulties of psycho-analytic treatment.

All medical men know how difficult is the handling of sex neuroses and aberrations, and how quickly by introspection "sex" will monopolise attention, distort judgment, and pervert conduct. The difficulties on the educational side, where youth is concerned, are even greater. The analyst who holds the Freudian view that the primitive trends of the mind are mostly sexual in origin cannot but be influenced by that bias in the treatment of patients, who likewise will feel its reflected influence. And, lastly, there is a factor in psycho-analytic treatment which presents difficulties of its own. I refer to "transference," which means that emotions and fantasies awakened in the patient by the analysis are detached from their original associations and reincarnated in the analyst, who thus becomes a partner in the life of the patient—or to quote, "earlier experiences are revived not as past ones but in the form of a current relation to the person of the physician."

Is not such a relation of physician to patient putting too big a strain on human nature and might not positions of danger be provoked? It may be that in practice these difficulties are less apparent, but frank discussion is needed if doubt and misgiving are to be allayed. Once more the conclusion is the recognition by the profession of the increasing importance of the study of mind in health and illness. Within the fold that study will regain the perspective and restraint which in its present position of isolation it has lost.

INTEREST IN THE BEGINNINGS OF DISEASE.

Another development in medicine is the growing interest in the beginnings of disease. Within the profession this interest has received inspiration and direction from Sir James Mackenzie. The conception, birth, and vigour of the Institute for Clinical Research at St. Andrews constitute the climax of one of the remarkable careers in the annals of present-day medicine. This work is beneficent not only for the direct results it is achieving, but for its influence in bringing back men's minds to the fundamental importance of studying the patient—a study which had become somewhat overshadowed by the advances in laboratory methods. From another aspect biochemistry will, I venture to think, more and more throw light on the changes premonitory of disease. By coördination of the two methods of inquiry the surest progress will be achieved. Corresponding to this trend of thought within the profession there is a notable change in the attitude of the public, in whose mind health has assumed a positive conception, being no longer regarded as mere freedom from disease. Strength and perfection of frame are coming to be regarded as both a duty and pride of achievement, and people will pay more attention to digression from this high standard. To be too fat, or purple and breathless in the prime of life will be the object of censure just as now it is considered bad form to have a neglected mouth. As a result, if I may indulge in prophecy, methods of treatment will alter. For these early departures from health will not *hostels of health* replace hospitals to cure disease?

While continuing his employment the man who is lapsing from anatomical or physiological rectitude will reside in a hostel for a brief space, and under a suitable regime of rest, exercise, diet, training, and other treatment, will be restored to the joy of fitness. At present this growing sense of the value of health is too exclusively concerned with the physical aspect. The importance of mind health, however, will in time gain recognition, unless its significance is obscured by wild advocacy. And that recognition will be followed by a greatly-needed change in the opinions and demands concerning popular recreations and amusements.

PROBLEMS OF MEDICAL ORGANISATION.

In conclusion, I will consider, briefly, developments which affect our medical organisation. Growth of medical knowledge and the increasing number of sciences associated with it are steadily making diagnosis and treatment rest on collective, rather than individual efforts. Collective effort to be efficient and economical needs to be aggregated into organisations. It follows that institutions, especially equipped as hospitals and clinics with their laboratories and accessories, will be necessary throughout the country for all classes if the best that medicine can give is to be at the service of the nation.

If one approaches the question from an economic point of view the conclusion is the same. Complexity in diagnosis and treatments means increased cost, and as the cost increases the number of people who can defray that cost grows fewer. The result ensues that from this point of view the more medicine improves the less well are people served. The remedy is clearly massed production, which means institutional organisation. The conditions of family and social life point to the same conclusion. At the present time a large and increasing proportion of the population are not getting the best opportunities in illness. Those who frequent existing hospitals are getting those opportunities; the rich are also getting them, but that large mass of people of moderate means (and with existing taxation the word moderate carries increasing emphasis) are not.

This is a reproach. It is unfair to the individual, and to the disadvantage of the community. The public very properly look to us to say what the remedy should be. Its provision requires the coöperation of the public, but it is for us to indicate its nature and guide its application. Hence the importance of agreement amongst ourselves. Since the growth of such institutions must be gradual, it is the more important that the early one should be on the right lines, so as to set up a good standard for achievement. I will briefly put forward for discussion some of the conditions which in my judgment should be fulfilled.

They should be run on economic but not commercial lines. A fixed percentage (say, 6 per cent.) should be paid on the capital, and the rest of the profit should go to improving the equipment and usefulness of the institution. The laity should coöperate in the administration. The technical direction should be under a committee of medical men. It would be better for the bulk of the capital not to belong to members of the medical profession. There should be grades of comfort and luxury to suit varying pockets, but needless to say only one standard for all essentials, and that the best. There should be provision for a proportion of patients who cannot defray the cost of their treatment. The cost to all others would be at and above a basic economic charge. Professional fees could be included in, or be independent of, the charges for the use of the institution, but broadly the principle that fees are to be arranged between doctor and patient should be maintained.

Patients attending such institutions would retain their own doctors. The idea must never grow up that these institutions are homes for specialists only. There is an advantage in a consultant having an allotment of beds and his own equipment. That gives him his private workshop and yet he rubs shoulders with colleagues. One-man institutions are a mistake from every point of view. Should such institutions be built as annexes to existing town hospitals? Speaking generally, and in my opinion, emphatically not. Hospitals are situated where the benevolence and conditions of former days put them. No one would put them in their present positions if building them now.

An institution such as I have tried to adumbrate should be near enough to the edge of a city as to secure adequate space and air. Such an idea has been realised in part in a few localities (e.g., St. Chad's), but not in its entirety.

Institutions on these lines would solve the problem from the point of view of efficient medical treatment and also—for the people better placed—from the point of view of cost. But they would not solve it for the people of small means—say those earning £500-£600 a year. Such as these cannot even under the above conditions defray the cost of a serious illness out of income or savings. And yet they must be provided for. The only way I see is through some system of insurance. A State system of insurance for this purpose is neither desirable nor feasible. I should like to see the big insurance companies take the matter up, and cannot but think they would, if assured that the business would meet a public need and receive strong support. I know there are difficulties, such as the question of adequate control without ruinous charges for supervision, but they should not be insurmountable.

I put forward these suggestions for discussion with the strong conviction that it is for the profession to hammer out the best lines of development and give the public responsible advice.

Presidential Address
ON
NATURAL RESISTANCE
AND THE STUDY OF NORMAL DEFENCE MECHANISMS.

Delivered before the Section of Pathology of the Royal Society of Medicine on Oct. 17th

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IT is my first duty to express to you my great appreciation of the honour you have conferred upon me by electing me to be your president, and I would claim your indulgence in my efforts to realise the responsibility of the position and to maintain the traditions of this chair. For many reasons I prefer to think of this section less as an appanage of a great corporate body than as the lineal descendant of the Pathological Society of London which, with its roots deep in the past century, has seen pathology develop at the hands of the great masters and has witnessed the birth and growth of bacteriology and its sister science immunology. Some form of address from newly-elected presidents has been customary in the past, and I would desire your forbearance while I review certain aspects of immunity which have long baffled the experimental pathologist and which are certain to receive in the future more adequate consideration when the fundamentals of the science of immunity like those of all experimental sciences come to be relaid.

The phenomena to which I would direct your attention come in the category of what is known as natural immunity or natural resistance—a subject vast and many sided—and I would propose to consider simply what amount of light has been thrown on the elucidation of certain well-known instances of natural immunity to bacterial infection, by the study of the bactericidal functions of body cells and fluids. The infection I would choose for illustrative purposes is that of anthrax, largely because it has been in connexion with the peculiar and fascinating divergencies of susceptibility exhibited by animal species towards this infection, that defence mechanisms have been tested with a view to their elucidation.

PRELIMINARY CONSIDERATIONS.

Some preliminary considerations need ventilation before I proceed to the main theme. When one considers the enormous output of literature on immunity which, since the beginning of the century has followed regularly the discovery of some new defence mechanism, one has reason to feel that some sufficient explanation might have been vouchsafed us for the existence of these peculiar resistances, but as I hope to show you to-night, there is no subject in immunity which has been so persistently and yet so inadequately explored. The discovery of a new immunity mechanism has led in the first instance, as a rule, to its intensive exploitation for diagnostic or therapeutic purposes, and rightly so in the main. Some mechanisms have lent themselves more readily than others to such exploitation. Many again have failed to attract anything but a passing fancy and they have been promptly forgotten or ignored, while the great flood of freshly gathered facts and fictions has continued to roll on uninterrupted. And yet if it be true, as I believe, that knowledge is best grasped in its historical setting, then surely these half-forgotten theses must claim the attention of the serious investigator. I am no lover of the archives for their purely bibliographic interest, but I firmly believe that were more attention paid to the archives by the average investigator, not only would there be a welcome reduction of much unnecessary literature, but a keener vision of our science as a whole and a greater ambition to build truly. Even in my very brief working experience I have seen many an instance of failure, innocent usually, sometimes possibly deliberate, to fit some apparently novel fact into its proper setting in the great edifice of natural knowledge. None the less, with the colossal mass of literature on pathology, bacteriology, and immunity on our shelves, it is no easy task to comply with the historical method. To take the subject of immunity alone, it may be remembered that no fewer than 20 volumes of the *Zeitschrift für Immunitätsforschung* appeared in the five years preceding the war—a truly vast encyclopædia of alleged fact—and this single effort represented only a fraction perhaps of the total output for the period in question. In face of this, how is the junior investigator to be directed to lay his bricks in an edifice the alignment of which he cannot possibly know? The task, I admit, is hard, but I maintain that the ambition should ever be to build truly on the historical past so that when the time comes for synthesis the old bricks may simply require relaying. The real expert must aim to be a man of vision with a working knowledge of and a pride in a glorious historical accomplishment. A mastery of technique is often, in my opinion, of much less relative value.

THE PROBLEM OF NATURAL IMMUNITY.

Natural immunity remains a dark corner in our edifice. Immunology as an essentially experimental science has undoubtedly gained its chief triumphs in the domain of acquired immunity. It has sought with marked success not only to imitate the immunity that is seen to follow successful combat with the actual disease naturally contracted, but also to transfer the chief bearer of that immunity from the immune subject, be it recovered human or immunised horse, to the acute case. In some notable instances we seem to know with certainty what we are doing in so acting, that, for instance, the passive fluid injected represents simply so many units of an accurately titrated substance suspended, we shall say, in a vehicle of serum. So far as we are able to judge experimentally, the vehicle itself might be indifferent. In any case, if it has effects of its own apart from its known content of titratable substance, and there would appear to be some clinical evidence of their presence, these effects are not such as can be readily repeated or experimentally controlled. In other cases in which the passive transference of immune serum is followed by undoubted success as, for example, in anthrax, it has so far been impossible to determine precisely what particular principle in the serum so injected is responsible for the success. In other infections again, such as the coccal septicæmias, the success achieved has been but partial and fortuitous. Either the systems of titration on an *in vitro* basis have been unsatisfactory or, when

biological titration has been partially possible, the existing great variety of coccal types both in man and animals and their contrary affinities for various animal species will doubtless for long militate against the elaboration of any rational and stereotyped scheme of serotherapy in these infections. We may learn, however, from our difficulties. We can see that nature specifically unaided can successfully circumscribe the sphere of operation of a coccal or even an anthrax infection while she may fail to control a general invasion. We note also that nature not infrequently appears to derive much assistance in the control of infection from the inoculation, for example, of a normal serum or from the inoculation of some type of colloid fluid circumspectly administered. Possibly the not infrequently observed phenomenon of the incompatibility of double infections may be placed in the same category of facts. In any case there would appear to be abundant justification at the present stage of immunological research for the closest study of the normal defence mechanisms.

THE MECHANISMS OF DEFENCE.

It is a strange circumstance that those curious instances of normal resistance which are referred to in all the text-books should rest on such an insecure basis of fact from what one might call the quantitative standpoint. They, and the alleged explanatory mechanisms, appeared to fascinate the earlier workers intensely, but it does not appear that the experimental work they devoted to their solution can now be regarded as authoritative in the light of present knowledge. It would seem that as each new mechanism of defence was discovered it was immediately tested and generally found to explain the observed resistance to the satisfaction of the discoverer. In what follows I shall illustrate what has happened in the case of anthrax and draw certain inferences as to future lines of progress. Put succinctly, the problem before us is simply this: Is the mechanism of a certain case of natural resistance capable of full and satisfactory expression in terms of test-tube analysis? Or must other mechanisms than those with which we are familiar be called in to explain the phenomenon?

Earlier Contributions to the Subject.

The mechanisms are not many and it would appear advisable to summarise them briefly before discussing their application to the problem in question. What contributions to the mechanism of defence were made by the great masters of general pathology and cytology of the past half-century? I need not discuss, even if I possessed the necessary knowledge, the various doctrines and conceptions of inflammation that formed the basis of pathological teaching of possibly most of us, but it is very obvious from even cursory analysis of the works of the great masters that the phenomena of inflammation gradually but surely came to be regarded in the light of natural defence mechanisms. That this was so is abundantly evident at the commencement of the present century and in illustration I might cite the inaugural address of Marchand, a valued teacher of my own, on assuming the chair of Cohnheim at Leipzig in 1900. The title of his address was "Die Natürlichen Schutzmittel des Organismus," and it was an attempt to summarise in the sense of defence mechanisms the various changes produced in the course of the inflammatory process—changes in the circulation of the part, in the circulating blood elements and in the fixed tissue cells, the local leucocytic response, the clearing or scavenging of the infected area presumably brought about by ferments from living or broken-down leucocytes, the restoration of the circulatory mechanism by newly-formed vessels growing on a scaffolding of fibrin and perhaps gaining the necessary energy for their development from the discharged effusion, the consolidation of the whole by newly-formed tissue derived from the fixed tissue cells of the part—these and many other processes he regarded as essentially defence mechanisms depending on the reactivity of the local tissues.

On the whole I receive the impression from reading the works of these masters that their methods of work were too local and circumscribed to render the results capable of general applicability to the phenomena of bacterial invasion. They had little conception then of the vast potentialities for defence residing not only in the fluids circulating in the inflamed part but also in the emigrated leucocytes and possibly also in the fixed tissue cells. Since these days the immunologist has had his innings, but I am of opinion that again we shall return to the consideration on ampler lines of local condition and function in the widest sense if we are to understand thoroughly the rationale of natural immunity. Already one sees a tendency towards the combined histological and serological attack on these problems.

Metchnikoff's Conception of Phagocytic Action.

I pass to Metchnikoff, whose attempt to extend the sphere of phagocytic action from the physiological to the pathological field and to read into it the idea of a protective mechanism with an application to all higher animals possessing circulating amœboid elements, constituted the first large-scale conception calculated to raise the lore of inflammation from one of purely local to one of the most general application. It was, in fact, the commencement of immunity as a general science. To him the leucocyte came to be endowed with particular qualities and properties according to the reactivity of the host. It was, moreover, the source par excellence of any and all bactericidal substances that might be present in cell-free fluids of the body. The constant polemics into which his rigid adherence to the conception of the all-sufficiency of the phagocyte led him are now matters of history, but it has to be remembered that these very polemics with the rising school of humoralists led by Nuttall, Buchner, and a host of others, gave the stimulus to uncounted researches on the properties and sources of growth-inhibitory and bactericidal bodies in tissues and fluids. Metchnikoff sought to retrieve the position of the phagocyte by many ingeniously contrived experiments, but it was obvious that opinion was definitely ranged alongside the newer humoral ideas while the ultimate source of the alexin and the intermediary body or *substance sensibilisatrice*, the coöperative action of which with a thermolabile alexin was later demonstrated, were left more or less open questions. The final demonstration by Denys and Leclef, Mennes, and others showing the dependence of phagocytic action in immune serum on the presence of a *substance sensibilisatrice* and the extension of the principle to normal serum by Wright and Douglas constituted a reasonable enough reconciliation between the opposing views. We know, however, that absolutely independent phagocytic action cannot be excluded as a defence factor, especially when organisms of low virulence are in question, and researches on spontaneous phagocytosis have demonstrated that in a given collection of leucocytes exposed to organisms some individuals undoubtedly appear to possess much higher phagocytic powers than others. We have not reached the end of this particular problem.

Properties of the Normal Alexin.

After the phagocyte came the alexin of the cell-free fluids. The complex nature of the normal alexin and its presence both in plasma and in cell-free serum are now fairly generally accepted facts. It should be noted, however, that the complex nature of the normal alexin is much more difficult to demonstrate than that of the so-called bacteriolysin in immune serum, and, as we shall see, there is now evidence that certain normal sera possess considerable bactericidal and growth-inhibitory effects which are not destroyed by the usual inactivation temperatures. In fact, the test-organism in all these matters is of prime importance. Here it is sufficient to note that the normal alexin can kill or dissolve certain organisms while others are unaffected or at most suffer growth inhibition.

Properties of Leukins.

I pass to the leukins or the bactericidal substances present in extracts of leucocytes. The study of these arose largely out of the views expressed by

Buchner and Metchnikoff that the source of the alexin might possibly be found in such. The chief work on this defence mechanism, which has not attracted perhaps the attention it deserves, has been that of Hahn, Schattenfroh, Petterson, Kling, Manwaring, Schneider, and Petrie in this country. I need not recapitulate the various methods employed for securing potent extracts. These will be found in all text-books, but it is quite clear that the methods of extraction influence greatly the potency of the resulting product. I would note simply that these extracts do not lose their power of killing certain test organisms after heating, say, at 60° F. They can resist very much higher temperatures, even up to 80° F. The constitution of these leukins or endolysins is still uncertain. Some have attempted to show that they possess complementing powers in the presence of inactivated sera, but others have entirely failed to confirm such action. Petterson would say that these extracts contain both an alcohol-soluble and an alcohol-insoluble fraction, and that the one can inhibit the action of the other. These effects, however, are almost certainly to be reckoned in the category of inhibition phenomena explicable on colloidal principles. The chief interest of the leukins lies in the effects they produce on different groups of organisms, and in the similarity of such effects to those produced by very analogous extracts prepared from tissues, and which were demonstrated 20 years ago by Conradi, Korschun and Morgenroth, Tarassewitsch, and others. These leukins have, as a rule, been tested against organisms of the typhoid-coli group and organisms of the subtilis group, to which anthrax belongs. Curious differences have been shown by extracts of leucocytes of various animal species in their action on bacterial types. Thus guinea-pig leucocytic extracts are said to possess little or no bactericidal action on *B. typhosus*, while those from the rabbit are distinctly potent. Petrie, however, using extracts prepared from leucocytes triturated at a temperature of liquid air failed to demonstrate bactericidal bodies for *B. typhosus* in rabbit leucocytes. The leucocytic extracts of the hen have, according to Schneider, no action on *B. typhosus*, but a very considerable action on *B. anthracis*. On the other hand, the serum of the hen can kill *B. typhosus*, but has little action on *B. anthracis*, so that it would seem that absence of bactericidal property in the extract of a cell might be compensated by its presence in the surrounding fluid, and vice versa. The study of bactericidal bodies in tissue extracts and body secretions is again being actively pursued in connexion with bacteriophage problems. In the so-called bacteriophage, from whatever source it may be obtained, there is exhibited the same thermostability and *the same limitation of action to certain bacterial groups*. Rapidity of action of these leucocytic extracts on organisms of the subtilis group and slowness of action on organisms like *B. typhosus*, with subsequent overgrowth of presumably resistant organisms, are features which recall those noted in investigations connected with the bacteriophage and with the bactericidal bodies present in egg-white as demonstrated by Rettger and Fleming.

I may close this subject by noting the existence of the thermostable bactericidal body in rat serum. This body has been carefully tested by Pirenne against organisms of the subtilis group, and also organisms like *B. coli* and *B. pyocyaneus*. Plating experiments have shown that organisms like *B. mycoides*, *B. megatherium*, *B. subtilis* are rapidly killed off, while *B. proteus*, *B. coli*, and *B. pyocyaneus* multiply freely. The cholera vibrio is also killed off, but this action was found to be due to the ordinary thermolabile alexin in the rat serum and it disappeared after inactivation of the serum.

Proteolytic Bodies in Leucocytes.

There remain only the proteolytic bodies contained in leucocytes, and which have been studied by many workers chiefly in connexion with the so-called antitryptic action of serum. We know little or nothing of their action on bacteria, and indeed it would be difficult to separate any such action exhibited from that due to the more generally studied endolysins. I may just mention the alleged existence of bactericidal bodies in platelets, a subject introduced by Gruber and Futaki in 1907, and but little studied since. These authors came to the conclusion that the bactericidal action on anthrax of normal rabbit serum (a highly susceptible animal) depended on substances derived from the platelets. Barreau, who continued this work, found that the serum of the dog (a highly resistant animal to anthrax) had no action on anthrax nor had its platelets. He concluded, however, that the platelet bactericidal bodies or plakins probably did not play much of a part in natural resistance, as the rat, for instance, a resistant animal, was rich in plakins, while the rabbit, a susceptible animal, was equally so. It is possible that the recent work on the purely mechanical function of blood platelets in removing suspended organisms by virtue of their adhesive properties may throw a different light on these alleged bactericidal substances in platelets.

ANIMAL EXPERIMENTS.

The application of these defence mechanisms to the elucidation of natural resistance to anthrax can now be very shortly considered. The resistant animals chiefly studied have been the frog, the fowl (especially the hen and pigeon), the rat, and the dog, but as I have indicated before, we have no accurate data of a quantitative kind as to the extent of this resistance in most cases. There is no doubt that the frog presents an extraordinary resistance to anthrax infection—a resistance which in the early days was attributed to its low body temperature. Attempts were made to infect frogs kept at 37°C., and in these circumstances the animals readily succumbed. Metchnikoff attributed the deaths in these cases to diminished phagocytic action, whereas in the frog, whose temperature was not interfered with, exuberant phagocytosis at the seat of inoculation afforded sufficient explanation of the immunity. The humoralists, however, maintained that the immunity was due to the bactericidal properties of the local lymph (Nuttall, Baumgarten, Petruschky, &c.). Metchnikoff countered this by showing that *B. anthracis* could grow readily in frog plasma. Galli-Valerio favoured the combined action of phagocytosis and bactericidal property of lymph as the most likely explanation. The matter remains quite obscure, and a more recent worker, Ditthorn, simply states that anthrax rods inoculated in any way into frogs show degenerative changes in a few days and lose their contours. The test organisms may, of course, play a decisive rôle in view of the fact that Dieudonné, for example, cultivated a race of anthrax growing abundantly at 12° C., and with it succeeded in killing frogs readily. These experiments require confirmation.

With regard to fowls, the hen and pigeon, and particularly the former, are known to possess high resistance, and in the classical experiments of Pasteur and Joubert, in 1878, the immunity was attributed to the high body temperature of the fowl. By immersing the fowl in cold water infection took place. The death under such circumstances has been attributed by later workers to a general lowering of resistance, and not to an inability on the part of *B. anthracis* to grow at the high temperature of the fowl. Metchnikoff maintained that phagocytosis in the normal hen was rapid and complete, and in the cooled hen very poor. Later, Thiltges stated that phagocytosis was not in evidence, and that the immunity was due to the bactericidal action of the plasma, a property which Gengou denied. Thiltges agreed, however, with Metchnikoff in the matter of the pigeon. Bail and Petterson and Schneider ascribe the resistance to the action of the hen leukins, which act very powerfully on *B. anthracis*, while the serum has relatively little action. Donati in a more recent communication ascribes the immunity of the fowl simply to a local invasion of leucocytes, which hinder capsule formation, and by virtue of bacteri-

cidal substances secreted by them, and not by phagocytosis, secure the removal of the invaders.

It is notorious that the adult dog can tolerate without inconvenience the inoculation of large quantities of bacilli, and, as one might expect, this immunity has been attributed by Metchnikoff to phagocytosis at the site of inoculation. Hektoen later showed that in the presence of dog serum dog leucocytes readily took up *B. anthracis*. It would appear that the serum of the dog has but little or no anthracidal action as compared, for instance, with that of the rabbit, which is, on the contrary, a fairly highly susceptible animal. While without action on *B. anthracis*, dog serum, according to Petrie, has a powerful action on *B. typhosus*. Hektoen attributes some importance also to the leukins of the dog. Petrie, however, found none.

The rat presents a more interesting problem, though it has to be remembered that there is no absolute immunity in this species. Behring, in 1888, showed that rat serum was anthracidal, while Metchnikoff found that the main defence was the phagocytic response. The thermostability of the bactericidal body in rat serum, as shown by Pirenne and Horton, is a most interesting feature. It acts equally well at 18° C. as at 0° C., and remains active for fairly long periods in the cold.

SUMMARY.

To summarise, it must be confessed that the curiously contradictory and yet perhaps genuinely reasonable explanatory theses give us little that is solid to hang on to. No one instance of normal immunity has yet been investigated as a complete problem. Partial mechanisms only have been studied. The hearer might well conclude that dogs are immune because dogs are dogs, and so for rats, fowls, and frogs, but that would not be quite the impression I should like to make. If a certain animal is immune to a particular experimental infection, such as anthrax, one ought to be able to explain fully what local phenomena have occurred to prevent a general invasion by the organism. To do so effectively must involve the testing of each possible mechanism separately and in conjunction, and it must involve a return to the cytological study of the changes which the invading organism undergoes in situ. The problem must be attacked not only by methods which derive their authority from long experience with the bactericidal properties of cells and fluids, but also by methods which reflect the trend of present-day studies on general metabolism both of parasite and host. With regard to the former much has been made of the capsule, but the data on the point are contradictory. In every set of experiments strict attention must be paid to the maintenance of virulence. It may, indeed, be found that by experimental selection a test organism which has once proved virulent for one individual of a resistant species may prove equally so for all individuals of the species. Strains of *B. anthracis* have been thus selected which are alleged to have killed fowls, rats, and frogs, but the experiments lack confirmation.

Another important aspect of the subject which has recently been brought to the forefront by Besredka relates to the site of inoculation of the test organism. In the course of his researches on the production of immunity by vaccinating that portion only of the body which is most susceptible Besredka has turned his attention to anthrax infection in the guinea-pig, an animal notoriously difficult to protect by any method of vaccination. He shows experimentally what, by the way, had been amply demonstrated 20 years ago by Noetzel, that animals like the rabbit and guinea-pig can tolerate easily doses of virulent anthrax if introduced directly into the circulation or into the peritoneal cavity without contaminating the cutaneous tissues. This can be avoided by a special and careful technique. According to Besredka the skin of the guinea-pig is the only susceptible portion of the guinea-pig's anatomy, and if it had no skin it would be a highly refractory animal instead of being, as it is, one of the most susceptible. He further demonstrated the possibility of securing solid immunity to anthrax, by whatever route inoculated, by vaccination of the skin with the attenuated Pasteurian vaccines. I do not wholly accept much of the evidence adduced so far in support of the conception of partial or local immunities or susceptibilities, but I believe the matter is worth the fullest investigation. In any case it is obvious that future work on natural resistance must take count of the possibility of very diverse immunities or susceptibilities apparently combined in one immune whole.

I have dealt in this address with species resistance solely, but it has to be remembered that there are racial variations of resistance within the species. For this reason the study of the mechanism of normal immunity will doubtless demand the services of the geneticist, who will be responsible for securing pedigreed stock for experimental purposes. This is no fanciful suggestion. In connexion with these most promising developments in experimental epidemiology which are being carried out in this country and in America the services of the geneticist must be invaluable. The dietetic factor, too, may prove of supreme importance in experiments on natural resistance, and there is already a body of evidence pointing in this direction. It is possible also that we may learn from comparative observations on the rationale of natural immunity in plants to fungal infections. In a recent address by Blackman some of these mechanisms reveal extraordinarily interesting relationships between the attacking fungus and the cells of the immune host. In conclusion, I feel that I have touched but the fringe of this vast subject, but if my exposure of the little we really know may stimulate further research I shall be content.

BEHAVIOUR CHANGES SUPERVENING UPON ENCEPHALITIS IN CHILDREN.*

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IT has long been recognised that changes in behaviour, more or less profound, not infrequently supervene upon certain inflammatory conditions or injuries of the brain. Only within the last two or three years, however, has the occurrence of the infection known as encephalitis lethargica supplied sufficient material for the study of these characteristic alterations. In a large number of cases which recover from this infection the after-history shows a definite and clearly marked change in reaction to environment which reveals itself as altered behaviour. The opportunities for a careful investigation into these changes are more favourable in dealing with children than with adults, though inquiry from the patient's friends will often elicit the fact that, since their illness, they have shown an irritability of temper or an intolerance of control, which renders them "difficult" or "impossible" to live with. The quiet housewife develops the temper of a shrew, or the model husband begins to neglect his home; such alterations in conduct, disconcerting and often quite inexplicable to the patient's friends, may assume a sociological importance, for cases will probably occur in which the question of criminal responsibility is raised, and the fact of a previous attack of encephalitis may be urged in defence of the perpetrator of some antisocial act which has brought him within the reach of the law.

Frequency.

Out of the cases in all ages notified in the City of Birmingham in the three years 1919–21, 15 have been described as showing some degree of mental or character change. It is, of course, too early to state how far these changes are permanent, but amongst children

* Read at a meeting of the Northern and Midland Division of the Medico-Psychological Association.

they are not infrequently of a very distinctive type, and serve to bring them within the purview of the children's court. Various educational and administrative difficulties thus arise.

We owe to Dr. G. F. Still [1] the first systematic study of the defects of moral control in children. Most of the children who recover from encephalitis attract attention by some disturbance of conduct or of quality of school work. In a small number of cases mental impairment reduces them to a condition of imbecile fatuity; the problem of their treatment then presents little difficulty, for they can clearly derive no benefit from education in an ordinary elementary school, and require protection and care. In other children, however, the capacities show little reduction, and such defect as may be present is masked by a perverseness of conduct which constitutes a nuisance to parents and teachers alike. The appropriate method of dealing with them then becomes a question of no little difficulty, as will be seen from the following series of cases which have come under my observation during the last two years.

CASE 1.—Female, born 1912, second of five children; others normal. Examination April 20th, 1921: Mother's report, "Began to talk and to walk early. Was forward in everything till she was taken bad two years ago." [2] Was then in the General Hospital for three months (diagnosis encephalitis), during which time she had two fits. On her return from the convalescent home was noticed to be changed in character. "She would grab hold of anything and take it if she wanted it. Will go into shops and take anything." Is very destructive, "cut up the sheets and curtains to make her doll's clothes, she also cuts up her own clothes; picks her nose and eats it, will pick up orange peel out of the gutter and eat it, set the baby's head alight with a candle. Will take her father's food from under his eyes. If locked up in a room will escape through the window or in some other way." She was promoted to the upper department, but was afterwards returned to the infant department. Mental equipment very poor. Cannot write her name or copy a square. Admitted to a special school, found to be exceedingly intractable, and finally sent to the infirmary, from which, after an escape, she was sent to the school department of the Monyhull Colony. March, 1922: Is stated to be "one nurse's work." Restless, talkative, entirely undependable and intractable. Constantly edges her way to the boys' side of the class-room, and shows marked sexual proclivities. Is very self-assertive and desirous of attracting the notice of any visitor. Educational attainments exceedingly meagre. There is little doubt that this girl will require permanent custodial care.

CASE 2.—Female, born 1913, third of five living children. Parents careful and intelligent. Child began to walk at 12 months and to talk at 18 months. History: Normal till March 18th, 1918, when she "had a fit," remained unconscious for a week, admitted to Children's Hospital. On discharge ten weeks later was noticed to be "cross-eyed." A month later had a "fit," "went into a stupor for several hours." "Since her illness has become completely changed." May 26th, 1919: I first saw her on this date; during the previous week she had stolen money at school and at home. School report: "Quite quick, irritable and selfish, bites and pinches other children." Talks very little, somewhat indistinctly. Restless and inattentive, mischievously prying into my cupboards and moving the things on my desk. Complete lack of shyness. Reads words of three or four letters very readily when her attention can be secured. Calculates up to 1*s.* quickly and accurately. Fails entirely with Healy's form board. Sept. 19th, 1919: In consequence of her habits and propensities was sent into Erdington Infirmary. Bit and scratched the nurse in charge, escaped down fire-escape, and climbed over high railings. April 14th, 1920: Recognises pictures and calculates quickly and readily. Recites poetry from memory. Restless and fidgety without any concentration. Does not appear to have stolen recently. June 2nd: Restless and imperative in her demands. "Pushed her small brother into the canal. Hit her elder sister over the head with a bottle, says 'it was only playing.'" Stole a small child's handkerchief and bananas in the street. Talks incessantly. August 22nd, 1921: Behaviour improved until the beginning of July, when she began to steal again. Had not been found stealing since the previous November. Wanders off, taking small children with her, often strangers, thus preventing them from going to school. Is causing much trouble with the neighbours on account of her thieving habits. "Will pick up any bits of food out of the gutter and eat it." "Went into a neighbour's house and took money from the table." "I took two half-crowns and two shillings, also a cake which I ate. The money I did not want I chucked down the sough." Her conduct is marked by foolishness and a complete lack of appreciation of the results of her actions. The children annoy her by calling her "balmy." She retaliates by hitting out wildly at the nearest, and possibly quite innocent, child. Her behaviour finally became such a nuisance to the neighbourhood that she was readmitted to the infirmary.

March 1st, 1922: Medical officer's report, Erdington Infirmary:—"Physically she does not appear to have any defects, but morally she is not all that could be desired. She is spiteful, bad-tempered, and constantly pilfering any little thing she happens to see. She knows it is stealing, but does not think she is doing any particular wrong. She is bright and fairly intelligent, and I should say would considerably improve with suitable training."

CASE 3.—Male, born 1908, quite well till Dec. 29th, 1919. Felt "sick" and was taken to the Children's Hospital, where he remained till Feb. 5th, 1920. Dr. L. Ball, under whom he came, writes: "He was a typical case of encephalitis lethargica. Slight pyrexia for 14 days after onset. Profound lethargy, unequal pupils, no squint, no nystagmus. Knee-jerks exaggerated. No Babinski. Slight lymphocytosis of cerebro-spinal fluid." May 12th, 1920: Shows twitching of facial muscles, with a marked stutter. Father reports: "Must have his own way in everything, if he does not he goes on and cries. All he likes to do is to order others about. He takes liberties with his mother." Is said to be difficult at school, where he is in Standard VI. No history of fits of any kind. Feb. 11th, 1922: Referred to me by the magistrate for examination, having previously been placed on probation for stealing. Father reports: "He has a mania for stealing. He's a good lad at home, but the moment he gets out of your sight there's no accounting for him. He takes from the shops apples, fruit, &c. Generally in a gang, they use him as a tool. Still tries to get his own way, but does not get into tempers now." Mother gives way to him. Father a strict disciplinarian. "Does not play games, but will read anything that he can lay his hands on." Reads well and intelligently, recognises a fallacy easily and with good discrimination. Did Demoor's sensory illusion test correctly. Manners good and correct. Thoughtfully returned his chair to its proper place on leaving my room. Has lost the facial twitchings and stutter, but these are said to return if he becomes excited. March 23rd, school report: "Doing good work in the top class of the school, Standard VIII. Since my last report, dated Oct. 28th, 1920, has shown considerable improvement. General conduct more normal, except that he occasionally shows signs of nervousness and is sometimes irritable. Attention is better sustained, marked improvement in response and interest. Still, however, very self-assertive, is certainly not of a retiring disposition." June 20th: Again charged at the children's court, having stolen flowers from a garden and done damage to trees to the value of 5*s.* Again placed on probation.

Note.—Since this paper was written he has again been before the children's court, and on August 16th, 1922, was committed to a reformatory on the charge of stealing four mouth-organs.

CASE 4.—Male, born 1912. Mother dead, lives with his grandmother and is somewhat neglected. Father a respectable hard-working man.

Examination June 24th, 1920.—Normal till illness a year ago, when he was in hospital for 12 weeks (notified as encephalitis). Grandmother now complains that she can do nothing with the boy. In the daytime he appears to behave normally, but at night becomes restless and destructive, gets out of bed and destroys things, breaks crockery, &c. Is stated to drop to sleep at all hours of the day, both at home and in school. Many complaints of his conduct in school. Found to know letters only, but could calculate up to 1*s.* correctly. Facile and plausible, but very fidgety, playing with articles on my desk, &c. March 4th, 1921: Answers rationally and with intelligence. Knows letters only (had been away from school for four months); memory span of six figures. Counts from 20 to 1 correctly. Memory drawing (Terman) exceedingly good. No concentration, attention wandering. Did Healy's form board with little difficulty. Said to get up at night (apparently in a somnambulistic state) and break the cups, &c. Father afraid that he will set the house on fire; wildly excited and "up to all sorts of tricks." Locked his father out of the house all night, on his return home from night-work. Subsequently certified as feeble-minded and sent to a special school in May, 1921. Report on admission to special school: He falls asleep while standing at his desk. Has frequently been found by the teacher asleep on the school steps on her arrival at 9 A.M. Father says that through the night he is wakeful and keeps the whole household awake. For the first few months at school he was set apart from the other children and was allowed to sleep until about noon each day. Even now he shows a tendency to fall asleep in school, if the lesson does not arouse his interest.

[1] Goulstonian Lectures, THE LANCET, 1902, i., 1008, 1077, 1163.
[2] Notes in inverted commas are the verbatim statements of the parents.

March 21st, 1922, school report: Is now practically normal and making good progress both in "three R" work and in handwork. His father writes: "Although put to bed at 7 P.M. each evening he never goes to sleep until the early hours of the morning, but he is not violent now." His behaviour in school has always been orderly, and he cannot be described as feeble-minded. This boy will be able to be returned to an ordinary elementary school.

CASE 5.—Male, aged 10, youngest of six children. Parents careful and intelligent: reported to health department as encephalitis on May 6th, 1918; stupor, ocular paralysis, and strabismus. Examination, Nov. 12th, 1919: Prior to illness normal in every way; is now very quick-tempered and irritable. Excitable, especially toward evening. Talks and walks in sleep. Moral behaviour has always been, and still remains, good. No affection of cranial nerves. No ptosis. Is in Standard IV. General intelligence good. An omnivorous reader.

March 23rd, 1922, school report: "Backward for his age (13), is only in Standard V. On casual observation gives the impression of being lazy, but I am inclined to think that he lacks the power of application. In response, attention, and interest he lacks the concentration of the average scholar."

CASE 6.—Female, born 1910; easy labour, second of four children. Began to walk and talk at 18 months. Went to school at 5 and was an ordinary child till May, 1919, when she was brought home from school with retention of urine. Became delirious during the night, and was taken to the Children's Hospital on the following morning, in a "semi-conscious" condition, blind in right eye. Diagnosis, encephalitis. Consciousness returned after three weeks; she was transferred to the infirmary, where she remained for seven months. At first lost the power of speech. Choreiform movements of arms appeared soon after transfer. Examination Sept. 9th, 1921: Movements very slow and deliberate. Failed completely with doll test, but did first form board correctly. Added three pennies and three half-pennies correctly. Did card test rightly on second attempt. Could write her name and knew letters but had no synthetic power for words. Apparently some eye defect. Mother's report: "Does not get to sleep till 6 in the morning. She tears all her clothes off her. She wriggles like a snake. Is easily roused to a passion. Is always pinching other children. Is always sleepy and wanting to lie down. Likes poking the fire." Wets her bed and clothes. Feb. 7th, 1922: Slow and almost stuporous, movements slow. Said to go on errands and to bring back the correct change. This I greatly doubt. Some fundus changes in eyes, especially right. Is still an out-patient at the hospital. In my opinion, slowly improving, but much below normal mental development.

It will be seen from this series of cases that the chief character changes found in children are an increased emotional instability with a reduction in the volitional inhibitions, leading to aberrations of conduct, a marked restlessness, especially in the evening accompanied by nocturnal wakefulness (which may be associated with hallucinatory manifestations) an apathy and inability for sustained attention, and an irregular type of intelligence capacity as revealed by educational tests. The majority of these cases show a heightened sensibility to environmental stresses. The chief interest of the cases is, however, the question of the relationship which they appear to establish between an organic lesion of the brain and the power of moral control. Still, in his Goulstonian lectures, already quoted, contends that moral control is dependent upon three psychical factors—viz., (1) A cognitive relation to the environment, (2) moral consciousness, (3) volition. Before we can accept this tripartite basis we shall find it necessary to define what is meant by "moral consciousness." If we mean thereby the capacity for weighing the consequences, immediate and remote, of an action or of abstention from such action, and of forming judgments by the exercise of reason, then the term may be satisfactory. Still seems to accept this view, for he writes:—

> "Both the simple cognitive relation to environment and the moral consciousness, which are essential to moral control, imply a reasoning comparison, albeit of very different degrees of complexity, and may therefore be regarded as intellectual processes, and consequently, in so far as defect of moral control is dependent upon the lack of these, is in itself a manifestation of impaired intellect."

Kühner has likened moral control to the topmost floor of a three-storeyed house. The ground floor is cognition (Erkenntnisvermögen), the first floor volition, or the power to exercise will (Willensfähigkeit), and the second or upper floor is the power of control, or inhibition (Widerstandsvermögen). The chief defect of these suppositions lies in the fact that they appear to ignore the affects which are in inseparable association with every action or conation. On the other hand, Tredgold approaches the question of moral control by the postulation of a moral sense, comparable with the specific senses. He writes:—

> "Just as each normal person possesses certain 'special' senses which enable him to appreciate sights, sounds, tastes, smells, and touch, so each normal person possesses certain senses which enable him to appreciate, to feel, and to act in accordance with certain ideals."

Here he is surely misled by his own false analogy, and his argument fails to carry conviction. The more acceptable position is that taken by Terman,[3] who writes: "Moral judgment, like business judgment or any other kind of higher thought-process, is a function of the intelligence." The power of foregoing immediate gratification for the sake of a future advantage depends partly upon memory, partly upon judgment and comparison (which in turn depend on memory), and partly on reason (which depends on judgment and so ultimately on memory). As Spinoza has said, "intellect and will are one and the same." Few will be prepared to deny that memory is a matter of the intellect, and will is, after all, a compromise between impulsions to action and inhibitions based upon reason and judgment.

The behaviour changes which make their appearance as the result of encephalitis seem largely dependent upon a changed reaction to environmental conditions, together with a heightened sensibility to their affective tone, with a reduction in the volitional inhibitions. Thus, to return to Kühner's analogy, while the ground floor, cognition, is present, the first floor is defective. Herein may be noted the marked contrast between meningeal and subcortical lesions. For example, in no case of cerebro-spinal meningitis notified in Birmingham during the last three years have any such character changes been found.

It will be noted that many of these children exhibit the same general temperamental type as that which we are accustomed to associate with the epileptic condition. There is the same irritability, lethargy, introversion, self-assertiveness, and absence of resistance to sudden impulsions which are so often seen in the psychical equivalents of an epileptic attack. The ingravescence of restlessness towards evening and the early part of the night has also its counterpart in the greater frequency of fits and the occurrence of night-terrors during the first hours of sleep. This analogy must not be pressed too far, but the similarity between the two conditions, especially in conduct, warrants careful consideration.

CASE 7.—Male, born 1915. Began to walk at 18 months and to talk at 15 months. At age of 3 fell off a cart on to his head and had a fit. Since then fits, sometimes two or three in the night; may go three weeks without an attack. Recently had 17 fits in one day. Attacks begin in right hand; left side of face said to twitch. Examination Feb. 21st, 1922: Examined for children's court. Asked teacher to allow him to go to urinal. Slipped out of school, went behind the counter of a draper's shop, and stole money from the till. Bought a complete Scout's rig-out with belt, knife, and whistle, put them on, and returned to school within the hour. Gave the remaining change to the teacher. Frequent other thefts admitted by the boy. Said to be bad-tempered. Mentally unusually sharp for age. April 26th, 1922: Again examined for children's court. Charged with not being under proper guardianship. Mother says his behaviour has been better since previous examination, but has twice been brought home by police for attempted shop-lifting. Has had three fits since Feb. 21st. Restless, excited, talkative, and inquisitive. Did form board A and B readily and added three pennies and three halfpennies at once. Reads an Infant Reader quickly and intelligently. Writes a simple sentence from dictation correctly. Gives a glib account of his thefts. Police say many complaints have been received from the neighbours.

Being under 7 years of age he cannot in law commit a crime. There seems to be little doubt that in this

[3] Measurement of Intelligence, p. 11.

case the behaviour was of the nature of a fugue. The boy has since been sent to a colony for epileptics.

The psychic manifestations of chorea appear to belong to the same order. Here we have a similar congeries of mental symptoms—the same faulty emotional control, with outbursts of irritability and departures from correct behaviour, the same reduction in the power of attention and concentration, and on the physical side the same type of muscular incoördination and weakness.

Prognosis.

The process of recovery of the physical sequelæ is slow but, speaking generally, ultimately complete. In the larger number of the cases detailed above there was also a gradual improvement in the behaviour and self-control, even in some of those children whose conduct has given the greatest cause for anxiety and made the outlook appear grave. This tendency to a gradual recovery is of the utmost importance from the point of view of treatment and disposal, and has a far-reaching bearing upon the whole question of juvenile delinquency, for exactly the same type of behaviour, without any appreciable intellectual defect, is exhibited by a certain number of children without any previous history of encephalitis or other lesion of the brain, whose persistent wrong-doing, despite persuasion, exhortation, or punishment, bring them within the accepted definition of moral imbecility. I have elsewhere expressed the view that this term is unsatisfactory, if we accept the Determinist standpoint that every psychical phenomenon must have an antecedent psychical cause. I believe that the more we understand the immense importance of repressed complexes upon the malleable minds of children, the less disposed we shall be to cut the Gordian knot of diagnosis by merely labelling such perversions of conduct as moral imbecility.

Much of the aberrant conduct of children can be explained as the result of regression. The progress towards a re-acquisition of the social virtues and a re-establishment of moral control, shown by the majority of the cases quoted in this paper, warrants a favourable prognosis and is, therefore, wholly against an undue haste in dealing with them as mentally deficient. This is an issue of great practical importance, when the question of disposal is under consideration, from either the educational or the sociological point of view. The Mental Deficiency Act, 1913, introduces into the definition of the class of person who may be dealt with under that Act two postulates—viz., the existence of defect from an early age, and a permanent incapacity to receive proper benefit from instruction in ordinary schools. It is clear from the context that the word "permanent" has here a very restricted connotation. In my own opinion this clause in the definition would have been better omitted, as children of deficient intellectual capacity are already dealt with by the Elementary Education (Defective and Epileptic) Act, 1899. But the majority of these cases do not conform to either of the postulates here laid down. The deficiency has not existed from birth, and it is highly questionable whether an onset at an age of 8 years or more can be included in the phrase "an early age." Moreover, the progress towards recovery which is manifested by the larger number of these cases solves the question of permanency. If we extend the meaning of "an early age" so as to include elder children, then we find ourselves on the horns of a dilemma, for in that case there is no logical reason to exclude dementia præcox, or even paranoia, from the same category. Yet the inclusion of such cases within the terms of the Mental Deficiency Act would be admittedly without justification. It may be urged that, if the parents are consenting parties to the petition under Section 2 (*a*) of the Act, the magistrate who hears the petition, on being satisfied that care, supervision, and control are in the interest of the patient, may make the order. If, however, consent is withheld, the magistrate is likely to require clear and indubitable evidence as to the early date of appearance, and the probability of permanent intellectual defect. In a paper read before this Association in July last I stated that these cases of post-encephalitis changes could not be dealt with under the Mental Deficiency Act. This statement produced a letter from Dr. W. B. Drummond,[4] in which he stated that he had in the institution under his care two children who had been certified as moral imbeciles on account of vicious propensities apparently resulting from their illness. This method of procedure, though undoubtedly convenient, seems to be an undue straining of the intention of the Act, and Dr. Drummond himself writes that it would have been a better course to certify them as feeble-minded rather than as moral imbeciles. But from what has been stated above the inclusion of this class of child in the group of the feeble-minded under the Mental Deficiency Act presents equal difficulties.

The Defective and Epileptic Children Acts, 1899 and 1914, offer an easier path for dealing with children for whom special supervision and education is indicated for the definition used includes neither the question of early age or permanency, but simply specifies a mental incapacity to receive benefit from the teaching in an ordinary school. Should the mental condition in time warrant return to such a school, there is a stipulation that the certificate of mental defect shall be handed to the parents. Should the mental condition, however, not improve, the child will pass at the age of 16 under the provisions of the Mental Deficiency Act (Section 2, (2) (*b*)).

A still readier method of procedure is that under the Poor law.[5] Here the sole criterion is a lack of parental ability to supply the necessary protection and control, coupled with an unsuitability for an ordinary school or institution. For the more intractable types of children this means of disposal will often be found the most satisfactory. Whatever method may be adopted, the main aim is clearly the restoration of emotional balance by diminishing as far as possible environmental stress. A prolonged holiday in the country or at the seaside may serve to accomplish this end, but for the majority of children, whose life is passed in overcrowded homes and noisy streets, this is impossible. For them the regulated and orderly routine of an institution offers the surest road to mental re-adjustment and to the re-establishment of normal self-control. The difficulty which faces us is that of securing this end within the limitations placed upon our powers by existing legislation.

[4] Brit. Med. Jour., 1922, i., 122.

[5] (Local Government Board (Mentally Defective Persons) Order, December, 1911. "Persons . . . . who by reason of mental defect are incapable of receiving proper benefit from ordinary instruction, or cannot be properly trained in association with other persons, in ordinary schools or institutions, or are incapable of using ordinary means or precautions for protecting themselves from injury or improper usage or treatment, or incapable of maintaining themselves by work.") Subjects to be dealt with under this Order must be under 21 years of age.

NEWCASTLE-UPON-TYNE AND NORTHERN COUNTIES MEDICAL SOCIETY.—The first meeting of the session was held in the Royal Victoria Infirmary on Oct. 5th, with Prof. Stuart McDonald, Vice-President, in the chair. Cases were shown by Dr. W. E. Hume, Dr. Horsley Drummond, Dr. George Hall, Mr. H. Brunton Angus, Mr. S. S. Whillis, Mr. R. J. Willan, and Mr. Hamilton Drummond. The pathological specimens were arranged by Mr. W. E. M. Wardill, curator of the Museum of the Durham University College of Medicine. A paper was read by Mr. F. C. Pybus on Some Surgical Aspects of Dyspepsia. During the meeting the news was received of the death of Dr. Lachlan G. Fraser, the President of the Society, and a vote of sympathy with his widow and family was passed. The Society meets monthly during the winter session, and in addition to the ordinary meetings two clinical and pathological meetings have been arranged for the convenience of country members at 4.30 P.M., one during the past week and one on Jan. 24th. The annual address is to be delivered on Dec. 7th by Sir Humphry Rolleston on Reflections on High Arterial Blood Pressure. The annual dinner will be held the same evening, when Sir Humphry Rolleston will be the guest of the society. On Feb. 1st an address on Diagnosis in Surgery will be given by Mr. D. P. D. Wilkie, of Edinburgh.

THE EFFECT OF IONS UPON AGGLUTINATION.

BY TAKUJI SHIONOYA, M.D.

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1. *Introduction.*

THE true mechanism of agglutination is still unknown. The first investigation upon it was described in 1899 by Bordet,[1] who showed that for the occurrence of the phenomenon not only the combination of agglutinin and bacteria, but also the presence of sodium chloride, is needed. Bordet found that if the salt was removed from the serum and from the suspension of bacteria by dialysis, and the serum and suspension mixed, agglutination did not occur, but that if a small amount of sodium chloride was added, agglutination promptly took place. According to this view agglutination is a phenomenon of molecular physics—the agglutinin acts on the bacteria or other cells and prepares them for agglutination by altering the relations of molecular attraction between them and the surrounding fluid, whilst the second phase, the loss of motility, clumping, &c., is brought about by the presence of salts as is the sedimentation of clay. Joos[2] observed that agglutinin was absorbed by bacteria. When the agglutinin-bacteria combination was precipitated by salt, he found that the concentration of salt in the supernatant fluid was decreased, so that he believed that true chemical action took place in agglutination. He distinguished two phases, primary and secondary, of the phenomenon: the absorption of agglutinin by agglutinable substance, and the precipitation of salt with the agglutinin-bacteria combination. Furthermore, he observed that in the secondary phase the precipitating action differs according to the kind of salt, chloride, iodide, bromide, &c., with monovalent cations, and believed that the acid radicals of salts took an important part in the action of precipitation.

Neisser and Friedemann,[3] Bechhold[4] and Friedberger,[5] investigated the precipitation of inorganic suspensions and of the colloids by several salts which possess negative electric charges, examined the limiting concentration of salt solution in which the action of precipitation took place in 24 hours, and proved distinctly that the really important factor in its action is the cation and not the anion. In addition to the agglutinin and bacteria, therefore, the presence of some cation is necessary for the mechanism of agglutination. In their experiments Joos[2] and Friedberger[5] did not, however, use equivalent solutions, while Neisser and Friedemann,[3] and Bechhold[4] used only various light metal salts, and their solutions were equivalent. To fill up these gaps, Porges[6] made use of the fact that the absorption of agglutinin by bacteria may be produced in the salt-free medium. He added toluol to a suspension of typhoid-agar-culture in distilled water, and to typhoid immunised serum, and dialysed each in running water for three days and in distilled water for two days more. After having ascertained that the water was free from chlorine ions, he mixed each 1 c.cm. of bacteria suspension with 0·5 c.cm. diluted serum and various diluted salt solutions, and observed the limiting concentration of salt in which the agglutination takes place. During his experiments with various dilutions of a normal solution of NaCl, KCl, NH_4Cl, $MgCl_2$, $NaNO_3$, KNO_3, NH_4NO_3, $Mg(NO_3)_2$, Na_2SO_4, K_2SO_4, $(NH_4)_2SO_4$, $MgSO_4$, he observed the relation between anions and cations and found that there is only small difference between Cl', NO_3' and SO_4'', but that the effect of Mg'' is 10 times greater than other cations. Buxton and Shaffer,[7] and Buxton and Teague,[8] also examined the precipitation of colloids with some simple common salts of mono- to trivalent cations (for example Al''', Fe''', &c.), and proved that there is no difference between the precipitation of agglutinin-bacteria combination and that of inorganic colloids. The results thus obtained show not only that the agglutination is a physico-chemical phenomenon in which the presence of salts is necessary, but also that these cations play an important part in it.

Such experiments with cations of a valency greater than three had not hitherto been tried, but it was evident that the agglutination is closely related to the valency rule. Accordingly an attempt was made, under the guidance of Prof. K. Miura, to investigate the effect of the valency of salts on the phenomenon of agglutination, and to examine the effect of cations thereon in the following manner.

2. *Method of Research.*

(A) *Agglutinin-bacteria combination.*—Porges[6] examined the precipitating action of salts by mixing them with the dialysed serum and bacteria, but as serum is of a complex nature it is not suitable for the investigation of the effect of ions. For my experiments I have prepared the salt-free agglutinin-bacteria in the following manner: Typhoid strains were prepared on 16 to 24 hour slope agar cultures, and the bacilli from 10 cultures suspended in 10 c.cm. of sterilised normal saline solution, care being taken to prevent admixture of agar or condensed water in the agar tube. To this suspension was added 1 c.cm. of typhoid immunised serum with an agglutination titre of 1 : 10,000. After placing in the thermostat for 30 minutes, 20 c.cm. distilled water were added and the combination centrifugalised: the supernatant fluid was removed, a further 20 c.cm. of distilled water added and the mixture again centrifugalised. The washing by centrifugalisation was repeated five times: the mixture was then placed in a dialysation shell, 40 c.cm. of distilled water were added, and the mixture dialysed in running water for five days, and in distilled water for two days, in order to free it completely from chlorine ions. A milky-white and diffusely turbid suspension of agglutinin-bacteria combination was obtained and used in the experiments as follows: Into a series of small test-tubes (previously boiled to free from alkaline matter and electrolytes) was put 1 c.cm. of various salt solutions in different concentration, and to each tube was added one drop of the agglutinin-bacteria suspension (each drop containing about one normal platinum loopful of the bacteria). After well mixing they were kept in the thermostat at 37° C. for two hours and afterwards at the room temperature for 18 hours. Macroscopic observation showed that the agglutinin-bacteria combination was precipitating in the bottom of the tube, while the supernatant fluid was clear: the fluid was more concentrated than the precipitation limit, for if its concentration was lower than the limiting value, it would not have clumped, and the supernatant liquid would have remained turbid. The spontaneous agglutination is to be distinguished easily from the ordinary agglutination phenomenon, for in the case of the former, mere shaking makes the fluid turbid.

(B) *Salts.*—Matsuno[9] found when investigating the effect of cations upon arsenious sulphide, that simple salts are not appropriate materials for the investigation of the effect of valency on the coagulation of colloidal arsenious sulphide. For example, the concentration of cupric sulphate passes over beyond the limiting value of other bivalent salts as shown on Table I. It dissociates perhaps not only as the formula—

$$CuSO_4 \rightleftarrows Cu'' + SO_4'',$$

but the hydrolysis would also take place partially in form of—

$$2CuSO_4 + 2H_2O \rightleftarrows Cu_2(OH)_2SO_4 + H_2SO_4,$$

so that its aqueous solution displays a faint acid reaction. To avoid this inconvenience it was necessary to search for salts with cations of several valencies. The bivalent or trivalent salts are common, but tetravalent salts are difficult to obtain, and pentavalent salts are still unknown. Prof. Shibata of the College of Science, Imperial University, Tokyo, was kind enough to furnish me with cobaltic complexes for this purpose. Though pentavalent salts are unknown

in complex salts of cobalt, yet it was possible to carry out experiments with salts from mono- to hexavalency. The cobaltic complexes were of different chemical composition as shown in Table II.

3. *Results of the Experiments.*

According to the colloid chemical process, it is evident that a negatively charged colloid begins to show minimum precipitation only after having been neutralised to some degree, and so it is suitable for my purpose to observe the minimum limiting concentration which causes the partial precipitation. Complete precipitation of colloid cannot be said to have made complete neutralisation of ions, for it may be thought that the precipitated substance would absorb more ions than were necessary to the complete precipitation. I have observed in experiments that some common salts—for example, $Cu(NO_3)_2$, $Al_2(SO_4)_3$, $Al_2(NO_3)_6$, &c.—bring about either incomplete agglutination, or no precipitation, in greater concentration than limiting value, but on the contrary complete coagulation takes place at the limiting concentration. This phenomenon is named the "restraint zone" by Neisser and Friedemann[3]; it is not observed with the solutions of cobaltic complexes, in which, when the concentration is greater than the minimal, complete precipitation takes place, and becomes gradually less complete as the concentration is reduced.

The limiting concentration hereafter mentioned means the lowest concentration at which the least trace of agglutination of the agglutinin-bacteria combination was found.

TABLE I.

The Limiting Concentration for Agglutination by Common Simple Salts.

L.E.C. = Limiting equivalent concentration.

(*a*) *Salts of Monovalent Cations.*

	L.E.C.		L.E.C.
NaCl	1/100	$NaNO_3$	1/100
KCl	1/100	Na_2SO_4	1/100
KNO_3	1/100	Aver. ..	1/100

(*b*) *Salts of Bivalent Cations.*

	L.E.C.		L.E.C
$MgSO_4$	1/2000	$CuSO_4$	1/10000
$Ba(NO_3)_2$	1/2000	$Cu(NO_3)_2$.. ..	1/10000
$CoCl_2$	1/2000	Mean ..	1/2000

(*c*) *Salts of Trivalent Cations.*

	L.E.C.		L.E.C.
$Al_2(SO_4)_3$	1/20000	$Cr_2(SO_4)_3$ ..	1/20000
$Al_2(NO_3)_6$ ..	1/20000	Aver. ..	1/20000

TABLE II.

Limiting Concentration for Agglutination by Cobalt Complex Salts.

(*a*) *Salts of Monovalent Cations.*

	L.E.C.
$[Co(NH_3)_4(NO_2)_2]Cl$	1/150
$[Co(NH_3)_4(CO_3)]_2SO_4$	1/150
Aver. ..	1/150

(*b*) *Salts of Bivalent Cations.*

$[Co(NH_3)_5Cl]Cl_2$	1/2000
$[Co(NH_3)_5NO_3]Cl_2$	1/2000
$[Co(NH_3)_4H_2O\cdot Cl_2$	1/1500
Mean ..	1/2000

(*c*) *Trivalent Complex Cobaltic Cations.*

$[Co(NH_3)_5H_2O]Cl_3$	1/10000
$[Co(NH_3)_6](NO_3)_3$	1/10000
$[Co(NH_3)_6]Cl_3$	1/10000
Aver. ..	1/10000

(*d*) *Tetravalent Complex Cobaltic Cation.*

$\left[\begin{matrix}(NH_3)_4\\H_2O\end{matrix}\right\rangle CoNH_2Co\left\langle\begin{matrix}Cl\\(NH_3)_4\end{matrix}\right]Cl_4$.. 1/30000

(*e*) ***Hexavalent Complex Cobaltic Cations.***

$[Co[Co(NH_3)_4(OH)_2]_3](SO_4)_3$ ..	1/100000
$[Co_4(OH)_6(NH_3)_{12}]Cl_6$	1/100000

In the above experiments it is shown that the limiting concentration of precipitation depends only upon the cations, and this is common for either simple or complex salts. The results obtained by Neisser and Friedemann,[3] and Bechhold,[4] in their experiments with inorganic, and those of Porges,[6] Buxton and Shaffer,[7] Buxton and Teague,[8] with organic colloids, are in complete accord with mine, and, moreover, the important question of the dependence of the agglutination phenomenon upon the cations of the indispensable salts is brought into line. The valency rule established by Freundlich[10] is as follows. Presuming that the neutral salts in their equivalent solution are, despite their valencies, adsorbed in the same manner, the approximate values of concentration of complete precipitation have been obtained by the calculation based on the adsorption curve. His idea can be expressed also as follows: Since the electric charges of mono-, bi-, and tri-valent ions are in the ratio of 1 : 2 : 3 the amounts which should be adsorbed causing a complete coagulation should be in the ratio of 3 : 1·5 : 1, and if we plot the logarithm of the precipitating concentrations against that of numbers —i.e., 3, 1·5 and 1 for mono-, bi-, and tri-valent ions respectively—it would give a straight line. The above theory has been proved by his experiment with arsenious sulphide colloid and platinum colloid solution.

Before Freundlich, Whetham[11] published his research on the effect of valency on the precipitation of hydrosols. He deduced the following equation from a consideration of the probability of collision:

$$C_1 : C_2 : C_3 = K^3 : K^2 : K^1$$

where C_1, C_2, and C_3 are the molecular concentrations of coagulation of mono-, bi-, and tri-valent ions respectively, K is a constant. If this formula is correct, it must be a straight line when plotted, taking the logarithm of concentration of precipitation and the valency of the ions as its axes of coördinates, but in the present experiment it gave a curve, as shown by Fig. 1, in place of a straight line. The theory of

FIG. 1.

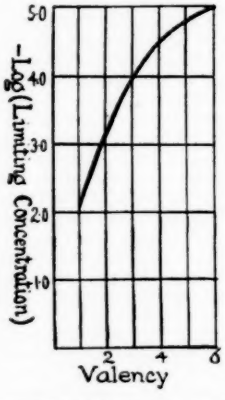
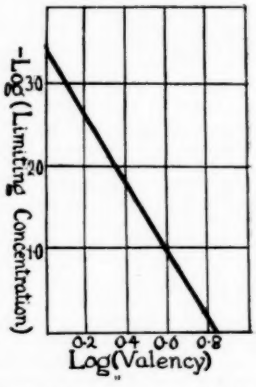


FIG. 2.



Freundlich[10] was clearly verified by the investigation of Matsuno[9]; taking the logarithm of the valencies of the cobaltamines as the abscissa and those of the limiting values for precipitation of colloidal arsenic sulphide as ordinate, a straight line (Fig. 2) was obtained, and he was able to deduce the following equation:—$\log S_n + \beta \log n + \alpha = 0$.

From the results of our experiments of agglutination of simple agglutinin-bacteria combination with solution of cobaltic complexes, it is again affirmed that if we plot the logarithm of limiting concentrations of cobaltic complexes as the ordinate and those of the valencies as the abscissa, a straight line is obtained (Fig. 3). Accordingly the equation relating limiting concentration and valencies of cobaltic complexes is

$$\log S_n + \beta \log n + \alpha = 0 \ldots\ldots (1),$$

where S_n is the limiting value of n-valent ion, n the valency and α and β are constants.

When $n=1$, $-\log S_1=a$, the equation (1) will be now,

$$\log S_n + \beta \log n - \log S_1 = 0$$

or

$$\log S = \log S_1 - \beta \log n \quad \ldots\ldots\ldots (2).$$

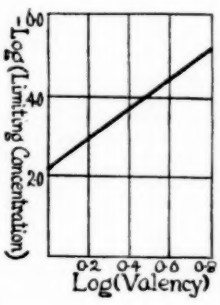
The value of β in the above equation can be calculated from the equation,

$$\beta = \frac{\log S_1 - \log S_n}{\log n},$$

substituting the experimental data for S_1 and S_n. The results of calculation was as follows:—

For bivalent ions	..	3·733
,, trivalent ions	..	3·620
,, tetravalent ions	..	3·821
,, hexavalent ions	..	3·628
Aver.	..	3·7

FIG. 3.



This number is applicable only in the case of agglutination of the combination of typhoid bacilli with its agglutinin in the solution of cobaltic complexes.

Putting $\beta=3·7$ in the equation (2), the equation was deduced:—$\log S_n = \log S_1 - 3·7 \log n$. It gave:—

Limiting value equivalent concentrations.

Valency.	Observed.	Calculated.
1 ..	1/150 ..	—
2 ..	1/2000 ..	1/1950
3 ..	1/10000 ..	1/8738
4 ..	1/30000 ..	1/25336
5 ..	—	—
6 ..	1/100000 ..	1/113568

In comparing the calculated limiting values with those obtained by experiment, it is found that close conformity exists.

Since the experiments with common simple salts, for example, $CuSO_4$, gave by reason of hydrolysis instead of a straight line a curve, they are not suitable materials for the observation of effect of valencies of salts upon agglutination. The precipitation of agglutinin-bacteria combination is produced through the force of certain amounts of cations and that precipitation follows the valency rule in the same manner as in the case of precipitation of inorganic colloids.

4. *Summary.*

1. A pure salt free agglutinin-bacteria combination has been prepared by repeated washing of the agglutinin-bacteria mixture with distilled water and subsequent dialysis. As the common simple salts are not suitable, owing to hydrolysis and other causes, for the purpose of testing the effect of ions, the cobaltic complexes of valency from 1 to 6 were used, with which the author has been able to test the effect of positive complex ions.

2. It has been found that the more the valency of the cation (from 1 to 6) increases, the less becomes the limiting concentration with which agglutination takes place; further, it has been found that there exists such close relation between them that when a logarithmic curve is plotted of the limiting values and of the valencies, a straight line is formed. The precipitating action of the agglutinin-bacteria combination is entirely in accordance with the valency rule, and the author has proved that as precipitation occurs through the action of cations, it is a colloid bearing negative electric charges.

The author wishes to express his indebtedness to Prof. K. Miura for guidance and encouragement in this research, to Mr. Y. Shibata, Professor at the College of Science, for much valuable material, and to Dr. T. Itakura for helpful advice.

Addendum.—The above-mentioned findings are not only applicable to the agglutination of the agglutinin-bacteria combination by salts but the same relations seem to appear in the case of hæmagglutination, which is at present in the course of investigation and will be published in a later report.

(*Continued at foot of next column.*)

SATURNINE ASTHMA:

IS THERE SUCH A MALADY?

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Is there such a malady as saturnine asthma?

History of Case.—Twenty-two years ago I examined for a life insurance company, and passed as a first-class life, a male aged 21. Ten years afterwards he was examined by another medical man for another office, and again was passed as a first-class life. Eight years ago he had pleurisy from which he was said to have made a good recovery. He had good health until 1918 when he began to suffer from shortness of breath on going up an incline. The dyspnœa came on gradually and was believed by the medical men who saw him to be the result of cardiac overstrain. Rest was prescribed, but instead of following out this instruction, patient went on with his business. During 1918 he was attached to the anti-aircraft service, and regularly took his share of night work, attending to office duties during the day. When thus engaged he again began to experience shortness of breath. In January, 1919, he developed bronchitis, in the course of which asthma supervened. Six months afterwards, as tubercle bacilli were found in the sputum, patient was sent to a sanatorium in Scotland, where he was informed that his malady was not bronchitis and asthma, but that the so-called asthma was due to some toxic cause, the nature of which was not ascertained.

Prior to this the patient had been losing weight, but during the three months he was in the sanatorium in 1919 he gained 22 lb. in weight and came home. In September, 1920, he returned to the sanatorium. It was now noticed that his finger-nails were black. Vomiting at this stage supervened, and after a residence of three months in the sanatorium tachycardia developed. At the time no explanation was forthcoming as to the blackening of the finger-nails, the vomiting, and tachycardia. The asthmatic seizures kept recurring and were severe. After a rest in bed for several weeks the cardiac condition considerably improved. To iodide of potassium, given to relieve the asthma, patient exhibited marked intolerance; instead of giving relief it brought on respiratory spasm attended by an acute rash on the skin. At this stage he consulted a London physician.

Last February he was sent to me by Dr. John Macfadyen of Newcastle-on-Tyne. On examining the patient wheezing râles could be heard pretty well all over the chest attended by prolonged expiration; over the right apex posteriorly dry friction could be heard, with here and there small moist râles. There was

(*Continued from previous column.*)

BIBLIOGRAPHY.

1. Bordet: Mechanisme de l'agglutination, Annales de Pasteur, 1899.
2. Joos: Untersuchungen über die Bedeutung der Salze bei der Aggl. Zeitschrift f. Hygiene, Bd. 36; Untersuchungen über den Mechanismus der Agglutination, Zeitschrift f. Hygiene, Bd. 40.
3. Neisser u. Friedemann: Studien über Ausflockungserscheinungen, Münch. Med. W., Nr. 11, 1904; Studien über Ausflockungserscheinungen, Münch. Med. W., Nr. 10, 1904.
4. Bechhold: Die Ausflockung von Suspension bez. Kolloiden u. die Bakterienagglutination, Z. f. phys. Chem., Bd. 48.
5. Friedberger: Untersuchungen über die Bedeutung der Salze für die Agglutination, C. f. Bakt., Bd. 30, 1901; Ueber die Wirkungsweise anorganischer Salze u. organischer Kristalloide auf die Agglutination der Bakterien, C. f. Bakt., Bd. 31, 1902.
6. Porges: Ueber die Beziehungen zwischen Bacterienagglutination u. Ausflockungserscheinungen der Kolloide, C. f. Bakt., Bd. 40, 1906.
7. Buxton u. Shaffer: Die Agglutination in physik. Hinsicht., Z. f. phys. Chem., Bd. 57, 47.
8. Buxton u. Teague: Die Agglutination in physik. Hinsicht., Z. f. phys. Chem., Bd. 57, 64.
9. Matsuno: The Coagulation of Arsenious Sulphide Sol by Cobaltic Complexes, Journal of Tokyo Chem. Society, No. 10, 1908.
10. Freundlich: Zeitschrift für physikalische Chemie, Bd. 44, 144.
11. Whetham: Phil. Mag., 1899, 48, 474.

considerable shortness of breath. After the patient had walked quietly in my consulting room his respiratory rate would rise to 40 in the minute. There was nothing specially detected in the heart; the abdomen was retracted and no pain was elicited therein on pressure; knee-jerks were normal; urine was free from albumin; gums were healthy and the pulse was 88.

Hair-Wash a Causative Agent?

On inquiring into the history I was informed that for the last five years patient had been in the habit, off and on, of using a well-known hair-wash, and that during the discontinuance of this, on his first visit to the sanatorium in the autumn of 1919, he regained health and added 22 lb. to his weight. Subsequently he had resorted to the use of the hair-wash and the asthma had returned. In November, 1920, he recovered much of his lost health. During this period the use of the hair-wash had been discontinued. When finally he had entirely discarded the hair-wash the asthma recurred but seldom and the spasms were not severe.

It should be mentioned that during his illness patient had become extremely susceptible to certain kinds of food and drugs. I have mentioned potassium iodide, but if boric acid was present in the milk he drank or sodium bicarbonate in bread he ate either of these substances would induce bronchial spasm.

Phthisical patients in whom there are bronchial symptoms may be liable to asthma, but the spasms which occurred in the patient whose history I have reported were of a severity quite unusual in pulmonary tuberculosis; so much so, that the attacks drew from the resident medical officer of the sanatorium the remark that they hardly corresponded to those of ordinary asthma, but were due to the action of some unrecognised poison. In consequence of the history given to me I had the hair-wash and a sample of patient's urine sent to an analytical chemist for examination; a blood-film was also sent to Prof. Stuart McDonald. The reports received showed that the hair-wash contained lead in considerable quantity, and the urine a trace of lead; the blood contained a few punctate basophilia.

Further History.—Owing to the patient's sensitiveness to certains kinds of food and drugs, amounting practically to anaphylaxia, I prescribed no medicine: his dietary was left in the hands of his wife, who had carefully studied her husband's susceptibilities and knew best what food suited him.

In June I re-examined the patient on his return from a three months' sojourn in the sanatorium, wherein it appears that shortly after his readmission he had had what was called "food poisoning" owing to his having eaten bread which contained alum. From this he slowly recovered, and, after remaining fairly well for a period, he returned home. On re-examining him I noticed that the chest rose and fell very little during inspiration and expiration—the difference being only a little over half an inch; there was slight flattening of the percussion note over the upper part of left lung in front, feebleness of the respiratory murmur here and there, back and front, while, over the right apex posteriorly, there could be heard small dry crepitation at the end of inspiration. His respiratory rate was 35, blood pressure 100 mm. Hg. The urine was free from albumin; on examination by the analyst it was found to contain a trace of lead. No basophiles were found in the blood. No hair-wash had been used by the patient after his visit to me last February. It will be observed from my notes that the condition of the lungs in the last days of June was worse than in February. Eight days after his last visit to me patient had hæmoptysis. Dr. Macfadyen administered a small dose of morphia hypodermically which gave the patient relief and controlled the hæmorrhage. On the following evening there was a slight rise of temperature with an increased pulse-rate, the breathing became asthmatic, a slight hæmoptysis again recurred, and, ere the doctor could reach him, death had supervened.

Remarks.

Saturnine asthma is referred to by Dr. S. Bassano in *Il Lavoro*, February, 1922. He reminds us that Tedeschi[1] reported the occurrence of bronchial asthma in two patients who were the subjects of chronic saturnism. One of Tedeschi's patients was a type-founder who for six years had suffered from bronchial asthma. In him there were pallor of the face, a blue line on the gums, tremors, accentuated second aortic sound, a slight trace of albumin, and the presence of lead in the urine. Beyond a degree of harshness of the respiratory murmur during, and for a short period after, the attacks of asthma, nothing abnormal was detected in the lungs. In the sputum eosinophile corpuscles and Curschmann's spirals were found. The patient changed his occupation. By degrees the attacks of asthma became less frequent and after 20 months they ceased altogether.

Tedeschi's second patient was a ship's varnisher. For eight years he had suffered from asthma. His gums showed a blue line, he was the subject of muscular tremors, second aortic sound was accentuated, and lead was present in the urine. During the attacks of asthma there was heard harsh respiratory murmur with bronchial râles. Bassano asks whether, in the former of Tedeschi's two patients, the lead dust inhaled might not have been the cause of the asthma. Meillère found lead in the lung tissue of animals whom he had caused to inhale lead dust, and it is known that lead has been found in the expectoration of workmen who are suffering from plumbism. Several Italian physicians are of the opinion that in persons, exposed to white-lead dust, attacks of bronchial asthma may occur, and that the catarrhal condition induced bears a close resemblance to that caused by inhalation of irritating dust. As a consequence of frequently recurring attacks of bronchitis and asthma the shortness of breath becomes almost continuous and resembles that met with in pneumokoniosis. Spasm of the glottis may occur in these cases. The influence of a cardio-renal cause is possible, but in my own patient, and in one of Tedeschi's, there was no albuminuria.

The relation of plumbism and asthma is not clear. In the patient whose case I have reported there were several conditions coexisting at one and the same time—viz., bronchitis with asthma, pulmonary tuberculosis, and saturnine impregnation. The presence of punctate basophiles in the blood and of lead in the urine, this latter even months after the use of the hair-wash had been discontinued, points to lead impregnation, while the history of the case points to absorption of the metal having taken place through the skin. The occurrence of asthma on each occasion the hair-wash was used and its cessation when the hair-wash was discarded cannot be altogether ignored. If lead is capable of inducing asthma, its mode of action may be indirect. I hardly think that—as some writers have asserted—asthma can be brought about in the body under these circumstances through the interaction of lead upon uric acid metabolism, nor is there anything of a reliable nature to support the theory of endocrine deficiency caused by defective secretion of the adrenals.

I return to the question is there such a malady as saturnine asthma, or is it simply asthma occurring in a saturnine? When Tedeschi's patient gave up work as a type-founder asthma ceased to trouble him, when the ship's varnisher retired from his work the attacks became less frequent, and in our patient the attacks came and went with the use and disuse of a hair-wash which contained lead. There was evidently in these three patients some close correlation between lead and asthma.

The subject is of interest from an industrial point of view. Saturnine asthma in a lead-worker is so extremely rare that I cannot recall a single case of it. I therefore wrote to two medical friends who are in charge of white-lead factories for their experience and the following are their replies. Dr. Francis Irvine of Leamington-on-Tyne says: "I have not come across a case of asthma due to the inhalation of lead dust"; and Dr. D. W. Inglis of Hebburn-on-Tyne writes: "I have gone carefully over my notes of lead-workers and their ailments, and I find that I have not noted a single case of asthma occurring amongst them." In white-

[1] Riforma Medica, Nov. 26th, 1921.

and red-lead factories at the present time the amount of dust present in the air has been reduced to a minimum, but even in factories where there is still a certain amount of dust asthma, is not met with among the workpeople. In further support of my contention of the freedom of lead-workers from asthma, even where the atmosphere of the factory is not free from dust, I cannot do better than again quote from the experience of Dr. Inglis: "During the war, when the manufacture of shrapnel bullets was carried on on a large scale in the Tyne lead-works, and where for a few weeks, when the mechanical arrangements were imperfect, there was a great deal of dust produced, dust consisting of powdered plumbago with about 33 per cent. of metallic lead in a fine state of subdivision. Among the young women who worked in this part of the works there were no cases of asthma, and very few cases of ordinary bronchial affections." My own opinion, supported by that of works' medical officers of larger experience, is that saturnine asthma is, in this country, practically unknown among lead-workers.

Apart from the question which I have discussed, the above record supplies the opportunity of drawing fresh attention to the dangers incidental to the use of hair-washes containing lead. One of the most interesting and sad accounts of lead-poisoning by the use of cosmetics is that reported by Drs. Barron and Habein,[2] wherein it is stated that as a consequence of applying as a cosmetic "white flake," analytically proved to be white-lead, in the form of a paste to the face, four fatal cases of saturnine encephalopathia occurred in one family.

[2] The American Journal of the Medical Sciences, December, 1921, p. 833.

THE LYMPHOIDOCYTE AND THE TÜRK CELL:

THEIR HÆMATOLOGICAL RELATIONSHIPS AND CLINICAL SIGNIFICANCE.*

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IN 1919, an article was published in THE LANCET by Knyvett Gordon,[1] entitled, The Lymphoidocyte and its Clinical Significance, in which the discovery in the blood of cases of subacute bacterial endocarditis of a cell, to which that name was considered to be applicable, was reported, the number present amounting to 2 to 10 per cent. of the total leucocytes. Gordon considered that the presence of these cells could be demonstrated not only in bacterial endocarditis, but also in other cases of serious disease, and that their presence was of very serious prognostic significance. The matter seemed worthy of further investigation with a view to confirming or refuting the opinions expressed: such a course was, in fact, suggested by Knyvett Gordon himself. He published a further note[2] in 1921, in which he reported the presence of the lymphoidocyte, associated with marked leucopenia and presence of leucoblasts in 24 out of 26 cases of serious disease (malignant, tubercular, cardiac, &c.), all of which died within a brief period of examination. As the identification of such cells is dependent solely on their staining reactions, it was at once realised that a technique must be used which could be depended upon to give uniform results, that is, to produce a series of blood-films strictly comparable one with another.

Technique.

The following is an account of the technique employed. New slides are taken, lightly rubbed transversely with fine emery paper, laid in order on a slide tray and lightly polished just before use. "Spreaders" are made by cutting slides in half longitudinally—i.e., into pieces 3 in. × ½ in. After pricking the finger, a small drop of blood is taken up on one side of an end of a spreader. The spreader is then placed on a slide at an angle of 70°, with the drop of blood on the under side; the spreader is then moved along the slide at a moderate pace, drawing the drop of blood behind it in the angle between the slide and the spreader. The films are allowed to dry in the air and then stained by a method suggested by Knyvett Gordon in a personal letter to Prof. Ernest Glynn; this is a variant of the process devised by Pappenheim, and called by him "panoptic."

The following is a summary of the process:—(1) Jenner's stain, undiluted, 2 minutes; (2) Jenner's stain, diluted 1 : 20 with distilled water, 5 minutes; (3) Giemsa's stain, diluted 1 : 20 with distilled water, 20 minutes; (4) distilled water, 10 minutes; (5) blot, allow to dry in the air; no Canada balsam or coverslip used.

For this research the stained films were thinly smeared with cedar-wood oil and examined with an 8 mm. objective, under which it was found that large areas could be rapidly examined and that the magnification was just sufficient to permit abnormal cells to be selected for more detailed observation under 1/12 in. oil-immersion objective. The actual area of blood film examined measured in most instances about 2 in. × ½ in. The practice was adopted of examining the edges first, as the majority of the leucocytes are found there. This is at variance with the usual practice, which is to examine the slide in transverse strips from side to side; it was adopted in this work in order to save time, but, of course, is not applicable to differential counts.

There are several advantages in this method of staining over the shorter and easier methods now in common use—Leishman's stain, for example. These advantages are three in number: first, the results are uniform and strictly comparable one with another; secondly, there is clearer definition of the structure of the nucleus; and thirdly, there is a vigorous differentiation of the granules in the cytoplasm, not only of the basophil and eosinophil granules but also of the azur granules (so called) of the lymphocytes and other mononuclear cells. Table I. illustrates this point, and shows a comparison of three stains in common use—Leishman, Jenner, and Giemsa—with the panoptic method. This table is compiled as a result of the examination of a number of films stained by each method. All these stains have one feature in common, namely, that they contain eosin and methylene blue in mixture and/or chemical combination.[3] The stain now so well known as Jenner's stain was introduced by Louis Jenner in 1899: it is still the favourite with a few workers.

Leishman in 1901, and J. H. Wright in 1902, suggested modifications in the preparation and use in the study of blood cells of an eosinate of methylene blue devised by Romanovsky in 1891 for the demonstration of malaria parasites. These modifications, as well as those of May and others, are solutions in methyl alcohol of the dried precipitation compound obtained by the interaction of aqueous solutions of eosin and methylene blue mixed in molecular proportions.[3] These solutions (Leishman's chiefly in this country) are the standards for the clinical study of blood films in use to-day. Giemsa (1905) believes that the reddish-blue hue characteristic of the Romanovsky stain (and of its modifications), as well as its power to stain the so-called "azur granules" in lymphocytes, &c., is due to the formation of methyl-azur, and he has prepared this by a method of his own

* A communication read before a meeting of the Pathological Section of the Liverpool Medical Institution.

[1] THE LANCET, 1919, ii., 108. [2] Ibid., 1921, ii., 230.

[3] "No chemical formula can be devised to show the reaction."—Martindale.

TABLE I.—COMPARATIVE TABLE OF APPEARANCES BY DIFFERENT STAINS.

—	Leishman.	Jenner.	Giemsa.	Panoptic.
Reds.	Coppery red.	Brick red.	Rather faint.	Coppery red.
Polymorphs ..	Cy. brownish-pink, N. reddish-violet, chromatin moderately well diff.	Cy. pink, G. reddish-brown, N. blue, poor def.	Cy. almost colourless, N. very well stained, beautiful diff.	Cy. brownish-pink, G. pale reddish-brown, N. very well stained, very good chromatin diff.
Eosins	Brick red G.	Brilliant scarlet G.	G. poorly stained.	Brick red G.
Mast cells ..	Dark blue G., moderate nuclear def.	Dark violet G., poor nuclear def.	Bluish-violet G., good nuclear def.	Bluish-violet G., good nuclear def.
Monocytes ..	Cy. grey-blue, N. purple, nucleoli fair y well shown.	Cy. blue, nearly same colour as N., poor nuclear def.	Cy. pale blue, N. well diff., azur G. shown.	Cy. pale cloudy blue, azur G. shown, N. well diff., nucleoli when present.
Lymphocytes ..	Cy. faint blue, N. dark reddish-violet, nucleoli moderately well shown.	Cy. blue, N. blue, poor def.	Cy. pale blue, N. dark reddish-violet, azur G.	Cy. pale clear blue, azur G. and N. very well diff., nucleoli well shown.
Lymphoidocytes	Cy. blue, N. stains reddish-violet, chromatin network not well shown.	Cy. blue, N. pale blue, very poor diff., impossible to distinguish from a lymphocyte.	Cy. pale blue, N. reddish-violet, good def. of network and nucleoli, azur G. sometimes.	Cy. blue, perinuclear halo, azur G., N. reddish-violet, network and nucleoli well shown.
Myelocytes ..	Cy. pale pink, G. pale red, N. reddish-violet.	Cy. pale pink, G. bluish-red, N. blue, poor def.	Cy. and G. almost unstained, N. reddish-violet, well diff.	Cy. and G. pale reddish-brown, N. reddish-violet and well diff.

Cy. = Cytoplasm. G. = Granules. N. = Nucleus. Diff. = Differentiated. Def. = Definition.

under the name of "azur I." From this, by the addition of an equal part of medicinal methylene blue, he prepares what he calls "azur II.," and from this again, by the addition of eosin, he prepares "azur II.-eosin." The finished stain is said to be a solution of azur II.-eosin and azur I., in glycerine and methyl alcohol. The chemistry of the subject is extremely complex. In an excellent recent summary Martindale remarks, "It is obvious that the secret lies in the elucidation of 'azur I.'" Martindale found that a direct solution of eosin and "best medicinal" methylene blue in glycerine and methyl alcohol produced as good results as a solution made with the Giemsa powder of another maker, who has been presumed to hold the secret. The Giemsa powder used by one of us (J. C. M.) in this research was supplied by Martindale in 1919, and was obtained by him from a French source (exact composition not known); the other (C. V. P.) used Burroughs Wellcome tabloids, which gave identical staining reactions. These azur bodies must obviously be present in varying amounts in all eosin-blue preparations; this accounts for the clear demonstration of azur granules given by many samples of Leishman's stain. Giemsa introduced the stain which is known by his name specifically for the demonstration of spirochætes: it acts well as a stain for blood cells also, especially when preceded by Jenner's stain as in the process known as "panoptic," already described.

Nomenclature.

When an attempt is made to study the literature bearing on this topic, much confusion results from the varying nomenclature used by the different writers, with the result that only the closest scrutiny of the detailed description of a cell as given by one author makes it possible to determine if it be the same as, or a different cell from, that described by others under another name. For example, in the glossary of hæmatological terms in Gruner's "Biology of the Blood Cell," under the heading "Lymphoidocyte," no less than 86 synonyms are given, of which the following are a selection:—Lymphoblast; myeloblast; lymphomyeloblast; autoparenchymatous proliferating myeloid parent cell; cellule medullaire de Cornil; endothelioid macrophage (Metchnikoff); lymphoblastic macrolymphocyte; Marchand's leucocytoid wandering cell; &c.

In the earlier stages of our work we found considerable difficulty in distinguishing between the various mononucleated cells, and we gradually realised that in our earlier films we had been calling cells lymphoidocytes which had no relation to the primordial cell to which Pappenheim has given that name. In order to avoid confusion, we carefully compared our films with the illustrations and descriptions in hæmatological literature, especially those in Pappenheim's works. We came to the conclusion that the deeply basophil cell, an occasional one of which may be found in many blood-films both normal and pathological, and of which a larger number is often present in the films from cases of infective endocarditis as well as in numerous other conditions, conforms most nearly to the one described by Türk under the name Reizungsform or irritation cell. We append a description of the cells with which we are most concerned, using names such as we deem to be suitable and definite and such as are used and understood by most hæmatologists.

Description of Cells.

The *lymphocyte* of normal blood has a coarse, deeply stained nucleus; the cytoplasm is a clear pale blue—narrow rim only in the case of the small lymphocyte, broad and extensive in the large lymphocyte—and usually contains a small number of discrete azur granules. The small lymphocyte is circular in outline; the large lymphocyte often very irregular.

The *mononuclear* cell (monocyte) of normal blood has a nucleus which stains much less deeply and is often very irregular in outline; its cytoplasm is usually large in extent and is pale blue, the colour often being obscured by the large number of azur granules present.

In the *lymphoidocyte*, the primordial mother cell, the cytoplasm forms a narrow rim around the nucleus and stains a moderately deep blue; the nucleus has a fine chromatin network, which stains much less deeply than that of the lymphocyte (leptochromatic and amblychromatic); three or more nucleoli can also be distinguished, appearing as clear translucent oval areas near the centre of the nucleus. The nuclear outline is not well defined, and the adjoining cytoplasm is often less deeply stained than the periphery, a condition described in the literature as the "perinuclear halo." A small number of fine azur granules in the cytoplasm can sometimes be made out. The lymphoidocyte is never found in the blood except in cases of leukæmia; it is the principal cell type of most cases of acute lymphatic leukæmia, constituting some 4 to 6 per cent. of the leucocytes in chronic cases, the number rising to 60 per cent. in more acute and in the terminal phase of many chronic cases (the so-called "myeloblastic crisis").

The *erythroblast*, or nucleated red blood corpuscle, varies greatly in size. The cytoplasm has seldom the clear pale blue of the lymphocyte; it varies from a dusky bluish-grey (polychromatophilia) to the eosin

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colour of the normal erythrocyte. The nucleus stains very deeply (becoming practically opaque) and shows condensation (pycnosis) of the chromatin network, often exhibiting a radial arrangement or a nodular outline (like a mulberry). The differential features of these cells are set out in table form.

The cell called by Türk, Reizungsform, often known as the *Türk cell*, has the following characteristics—somewhat variable in size, it is usually considerably larger than a red blood corpuscle, circular in shape with a regular, well-defined outline; the cytoplasm is deep blue, occasionally vacuolated, but never containing azur granules; the nucleus is eccentric, usually circular, occasionally reniform, staining deep purplish red and showing a coarse nuclear network (trachychromatic and pachychromatic); one or two nucleoli can sometimes be made out. Very rarely one meets with Türk cells containing two discrete nuclei. (See Table II.)

TABLE II.—*Differential Characters of Certain Somewhat Similar Types.*

—	Lymphoid-ocyte.	Türk cell.	Lympho-cyte.	Erythro-blast.
Cell.				
Size	Variable 6–12	Variable 8–15	Variable 6–12	6–9
Shape ..	Circular or ovoid	Circular or oval	Circular or oval	Circular
Contour ..	Regular, ill def.	Regular, well def.	Regular, well def.	Regular, well def.
Cytoplasm.				
Quantity ..	Narrow	Broad	Variable	Moderate
Colour ..	Dark blue	Very dark blue	Bright pale blue	"Dusky blue" or purple†
Perinuclear* ..	Usual	Occasional	Absent	Absent
"Azur" granules	Rarely a few	None	Usual‡	,,
Nucleus.				
Outline ..	Ill def.	Mod. def.	Clearly def.	Clearly def.
Network ..	Delicate	Coarse	Coarse	Pycnotic
Staining ..	Pale rose red	Strong rose red	Deep reddish violet	Deep reddish violet
Nucleoli ..	Often 3 or 4	1 or 2§	None	None

Def. = Defined.
* Clear zone or "halo." † Rarely bright blue.
‡ But variable in number and size. § Occasionally.

Türk's original description of these cells was given in a monograph on the hæmatology of acute infectious diseases published in Vienna in 1898. We have been unable to find a copy of this work in this country. The term Reizungsform may be translated "irritation cell" or "stimulation cell." Türk found them in cases of small-pox, but we have been unable to gather what clinical significance Türk attributed to them. No subsequent writers seem to give any definite findings on this matter; those who have published notes on the subject include Da Costa (1902), Buckmaster (1906), Türk (1905, 1908), Schridde (1908), Ehrlich and Lazarus (1905, translated by Arnitt, 1908), Buchanan (1909), Gulland and Goodall (1912), Gruner (1913), Arneth (1920), and Schleip (1920).

The conflicting opinions in the earlier literature as to the nature of the Türk cell were almost certainly due to the failure to distinguish it accurately from others superficially similar, especially the erythroblast. It is fairly clear that Türk himself, owing probably to the less definitive properties of his staining methods, included several different cells under the name "Reizungsformen," but it can be safely assumed that the "Türk cell" was among them. More recent writers, Schleip for example, are quite definite in using the term "Türk cell" to denote only the cell so named in this paper. The views of Arneth and Schleip would therefore place the "Türk cell" in the relation to other blood cells shown in the accompanying scheme of hæmopoiesis. This scheme represents views on hæmopoiesis most commonly accepted at the present day.

It will be seen that all blood cells may be traced back to the lymphoidocyte. There are three main branches arising from the lymphoidocyte representing the granular series, lymphoid series, and the erythrocyte series. Thus the lymphoidocyte is the ancestor of all the types of cell which may be seen in the blood. At some stage of their phylogenetic or ontogenetic history they have all passed through the lymphoidocyte stage. We have not attempted to show any distinction between ontogenesis and phylogenesis in the diagram because it is a very variable factor, and while usually two or more generations will intervene between the lymphoidocyte and the fully-formed polymorph, a micro-lymphoidocyte may become a polymorph by direct ontogenesis.

Between us we have examined blood films from 225 cases, the number being made up of 213 miscellaneous, non-leukæmic, 11 cases of leukæmia, and 1 case of "von Jaksch" anæmia. In the 213 non-leukæmic cases we failed to find a single lymphoidocyte. In the 11 cases of leukæmia they were found in varying numbers, 2 to 87 per cent. In the von Jaksch we found cells representing all the stages of transition from lymphoidocyte to normal red blood corpuscle.

Our findings as regards the Türk cell may be summarised as follows:—

The Türk Cell: Summary of Findings.

Present in—	Cases.
Infective endocarditis	10 out of 12
Non-infective endocarditis (mainly rheumatic) ..	2 ,, 12
Acute septic conditions as well as in 6 other cases in which sepsis may be regarded as a factor (fractured mandible, chronic appendicitis (2), tubercular rib, tubercular kidney, acute tuberculosis)	14 ,, 18 (20) (24)
Malignant disease (in all five cases in the alimentary tract, where septic infection must be a factor)	5 ,, 28
"Pernicious" anæmia	3 ,, 4
Secondary anæmia	5 ,, 7
Splenic anæmia with splenomegaly	3 ,, 6
Pneumonia (recovered)	2 ,, 4
Pneumonia (died)	2 ,, 3
Pericarditis (completely recovered)	1
Miscellaneous cases not classifiable	25

It will be readily seen from this summary that our findings are directly contradictory to those of Knyvett Gordon, at any rate as regards the lymphoidocyte; and we venture to claim that if such contradiction is due merely to a difference of opinion in the choice and use of nomenclature, our terminology is strictly

in accordance with usage of recent hæmatological literature. We are unable to aver that the cell we are calling the Türk cell is the one that Gordon terms the lymphoidocyte; that this is unlikely will be realised when our views as to its clinical significance are detailed in a later paragraph. Further, we estimate that the number of Türk cells present was usually 0·05 to 0·1 per cent., amounting in a few instances to 1 per cent. of the white cells—very different from the figures 2–10 per cent. given by Gordon as the number of lymphoidocytes found by him.

Experimental Work.

On a priori grounds the presence of a primitive type, such as the lymphoidocyte in the blood without the presence of cells representing the intermediate stages between it and fully differentiated normal blood inhabitants, seems unlikely. At Prof. E. Glynn's suggestion one of us (C. V. P.) induced severe disturbance in the hæmopoietic apparatus of rabbits to see if it were possible to cause the appearance of primitive cells in the blood. The rabbit was selected as the most suitable animal on account of the ease with which intravenous administrations can be made into the veins of the ear, and blood obtained therefrom by puncture of the shaved ear for purposes of making films and doing counts. The rabbit's blood cells are exactly similar to the human cells with the exception of the polymorphonuclear, which have much more prominent granules of a deep red-brown colour, and are usually known as amphophil polymorphonuclear leucocytes.

For rabbits 1 and 2 pilocarpine nitrate was used, and the dose was 30 mg. and 50 mg. respectively, given intravenously. These rabbits got a maximum leucocytosis of 18,100 and 19,600 respectively, but in neither case were any abnormal cells found.

Rabbits 3 and 4 were given sodium cinnamate in doses of 0·7 g. intravenously and 1 g. intraperitoneally. They did not show such a definite leucocytosis, the highest counts being 14,900 and 10,200 respectively. Again careful examination showed no abnormal cells.

Rabbit 5 was given a large dose, 7650 million live *Staphylococcus aureus*. The first effect was an almost complete disappearance of the amphophil polymorphonuclear leucocytes. These returned in later counts, and with them appeared a number of metamyelocytes, the immediate ontogenetic predecessors of the fully formed leucocytes. The leucocytosis in this case reached a maximum of 35,000. Even with this leucocytosis no cells earlier in the granular series than metamyelocytes were seen.

Rabbit 6 was given a gradually increasing series of doses of dead streptococci—5, 50, and 100 million—and then a live dose of 2 c.cm. of a 24 hours' culture of live streptococci. The results, while showing a rise after each inoculation, show a progressive decline in the total counts, and the figures do not attain anything like the total reached in rabbit 5. The same phenomenon—namely, disappearance of the amphophils immediately after the injection of live streptococci, was noted; this has been observed by other workers.

No abnormal cells were seen at any stage of any of the experiments, except the metamyelocytes in rabbit 5. One feature of all these experiments was the remarkably constant appearance of the Türk cells in the blood. They appear in 31 counts out of 42. With a view to testing Arneth's statement that they are derived by metaplasia from the lymphocytes, the following experiments were undertaken:—

Samples of blood were incubated for varying periods with different strains of bacteria. Controls were made with the same admixture of saline, citrate, &c., but without the bacteria, and were incubated for the same period. Films made at different periods were stained by panoptic, and then the lymphocytes were counted. They were divided in a purely arbitrary manner according to the staining reaction of their cytoplasm into light, medium, and dark classes, and the percentage of each class was determined. It may be held against this procedure that this arbitrary standard of colour may vary considerably with the personal factor. This is granted, and while not claiming strict accuracy for this method we think it demonstrates conclusively that the cells which were incubated with bacteria were on the whole considerably darker than the controls. And as the darkness of the cytoplasm is the main distinction of the Türk cell from the lymphocyte, we think it may be reasonably held that the lymphocytes have begun to show a Türk cell metaplasia under the influence of the "irritation" caused by the bacteria.

Technique.—Two Durham's tubes were filed and broken off ¼in. from the bottom. The small cups thus formed were supported by plasticine and used to mix the blood, &c. The blood was obtained by puncture of the finger and was collected in a capillary pipette which had a mark on it giving a volume of about 0·05 c.cm.; one volume of solution of sodium citrate (2 per cent. in normal saline) was first placed in each of the cups by means of the capillary pipette, and then four volumes of blood were withdrawn and added to each cup and the whole mixed thoroughly. Further, one volume of the emulsion of the selected organism in saline was added to one cup, and one volume of normal saline to the other cup, which acted as the control. Films were at once made, and then drops of the two mixtures were drawn up into capillary tubes, sealed at both ends, and incubated. To make the films it was only necessary to break each end of the capillary tube, insert one end of it through the closed end of a rubber teat, and by placing the moistened finger over the open end of the teat it was easy to expel the contents of the tube on to a slide. The films were then made with the half-slide method as already described.

In Expt. I. streptococci were used, in Expt. II. *Staphylococcus albus*, and in Expt. III. *Staphylococcus aureus*. In each case the percentage of lymphocytes with dark cytoplasm is greatly increased in the specimen inoculated with the bacteria and scarcely at all in the control incubated alone. Other bacteria were tried, but in several cases the lymphocytes were so altered in the course of the incubation that it was difficult to determine the colour of their cytoplasm, and no reliable counts could be done.

It must be admitted that thus far our criticism is mainly destructive. It remains to discuss whether any hypothesis as to the significance of the Türk cell can be constructed. It will be agreed that the cell we have here described by that name has staining properties which are sufficiently characteristic to warrant its being considered a definite hæmatological entity. As regards its clinical significance, a study of the findings recorded and analysed at once shows that it is found in the blood in the majority of cases of infection by bacteria, especially those in which the infection is more than local—i.e., where there is bacteræmia. The few cases of other conditions, not apparently associated with bacterial infection and not usually considered due to such in which Türk cells were found, are not sufficiently numerous to justify drawing a conclusion from them. In fact, the presence of an occasional Türk cell (one or two in a large blood film) can hardly be regarded as pathological: in this research they were found in at least one normal individual, and in other individuals where they could have no obvious pathological significance. The Türk cell was found in the majority of cases of infective endocarditis examined, but was absent from most of the cases of endocarditis which on clinical grounds were considered to be non-infective; the majority of the latter were rheumatic in origin.

It will be noted that practically all the cases of bacterial infection in which Türk cells were found were instances of infection by cocci, in which polymorphonuclear leucocytosis was the rule. It would be of interest to know whether Türk cells appear in cases of infection by bacilli—typhoid, for example—where the usual blood-picture is an absolute leucopenia with a relative lymphocytosis; cases have not been available for this research.

Diagnosis and Prognosis.

As a factor of diagnostic importance in a case, the presence of Türk cells in a blood film seems to suggest the existence of a fairly severe generalised infection; it points to the necessity of careful search for the primary focus where such is not obvious; in endocarditis, where on clinical grounds the diagnosis between infective and non-infective is in doubt, the discovery of Türk cells in a blood film would make the former condition the more probable. At the same time, its frequent occurrence, albeit in small numbers, in many conditions must be borne in mind, in order that it may be recognised when seen and not mistaken for other somewhat similar cells—leading perhaps to the diagnosis of pernicious anæmia when mistaken for an erythroblast, or of leukæmia when thought to be a lymphoidocyte.

From the point of view of prognosis the presence of the Türk cell must be considered as only one item

in the clinical picture. In endocarditis it points to the condition being infective, and consequently makes the outlook grave. But its discovery in other conditions seems to give the reverse prognostic indication. It was present in two cases of puerperal septicæmia, both of which recovered, and from both of which streptococci were obtained by blood culture. The opportunity of examining other cases of this condition is awaited with interest, in order to determine if the absence of the Türk cell is a bad prognostic sign. In the small number of cases of pneumonia examined the incidence of Türk cells had no relation to the morbidity. In the one case of acute pericarditis examined Türk cells were found in considerable numbers; the patient made a complete recovery and returned to a strenuous occupation. Schleip states that in diphtheria Türk cells "may occur in favourable cases."

Conclusions.

1. That the use of the term lymphoidocyte should be limited to the primordial cell from which all blood cells are developed.

2. That this cell has clearly defined staining reactions by which it can be distinguished from other cells.

3. That contrary to the evidence of Knyvett Gordon, we have failed to find the lymphoidocyte in infective endocarditis or other serious conditions, except disease of the hæmopoietic organs in which their occurrence is already well recognised.

4. That the Türk cell has characteristic hæmatological features and is found occasionally in normal blood—at most one or two per film.

5. That its presence in larger numbers is probably pathological and points to the existence of a generalised bacterial infection; and that as regards prognosis its presence has an indirect bearing only.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OPHTHALMOLOGY.

THE first meeting of this section of the Royal Society of Medicine in the new session took place on Oct. 13th, the newly elected President, Mr. A. L. WHITEHEAD, occupying the chair.

MR. WHITEHEAD delivered his presidential address on

Ocular Tuberculosis.

Tuberculosis was, he said, more frequent in Leeds and less frequent in the West Riding of Yorkshire than in England and Wales as a whole. England and Wales as a whole had a tuberculosis case-rate of 2·07, the lowest since 1914; that for the West Riding was 1·61. The case-rate for Leeds was 2·61. Tuberculous lesions of the eye were very rare in pulmonary tuberculosis, but if cases of ocular tuberculosis were followed up it was often found that other manifestations were present. In 1921 Igersheimer and Prinz published a paper giving the results of following up 92 scrofulous eye cases for 10 to 30 years. In 13·9 per cent. there were changes in the lungs, and 13 per cent. had symptoms of active tuberculosis. Mr. Whitehead considered there was an important difference between the severe spreading invasions of the eye, leading to more or less complete destruction of the eyeball, and the more chronic and benign forms of tuberculous infiltration; in the former typical giant cells and tubercle bacilli were frequently found, but in the latter there was usually failure to demonstrate them. In these the infection was believed to be due to a tuberculo-toxin acting on a specially prepared area. Miliary tubercles of the choroid in acute tuberculosis of infants were frequently present; in most of the fatal cases of tuberculous meningitis he had examined he had found miliary tubercles. These tubercles occurred in the same class of individuals as those having the less severe forms of tuberculous infection of the eye. They were a third to half the size of the optic disc, greyish-yellow, with a soft indefinite margin; later the circular clean-cut edges of the atrophic patch were very characteristic. Usually they were not recognised until a later age when vision is interfered with. He had not seen primary tubercle of the retina, but he had one case of what he regarded as a nodule in the papilla of tuberculous nature. Degenerative changes in vessels followed by hæmorrhages, sometimes into the vitreous, had been described, and he had experience of two cases in which vitreous hæmorrhages preceded other evidences of general tuberculous infection, and in those patients pulmonary tuberculosis occurred 12 to 18 months after the appearance of the hæmorrhages. Possibly some of the unexplained cases of recurrent vitreous hæmorrhage might be due to toxin infection from a tuberculous focus elsewhere in the body. Schieck especially had reported favourably on the use of tuberculin in recurrent retinal hæmorrhages.

Dealing with tuberculous iritis, he said that in many of the milder cases of this condition the nodules were small, they disappeared early, and left but little permanent change in the iris structure. The subjects were usually young and apparently robust females, with no other evidence of tuberculosis, but with a family history of susceptibility to the infection. In these cases tuberculin treatment, in proper dosage, had been frequently of value. Hessberg considered that more than half of all cases of iritis were attributable to tuberculosis. Phthisis and joint tuberculosis seldom co-existed, but frequently the lymphatic glands of mesentery and mediastinum were affected. In the view of most ophthalmologists the percentage given by Hessberg was much too high. Involvement of the lacrymal sac by the disease did not seem to be common, but he had seen it secondary to polypus of the nose and as an extension of tubercle of the ethmoid. An epiphora might develop secondary to nasal tuberculosis; in one such case it followed tuberculous ulceration of inferior turbinate. This patient, a girl of 12, also had tuberculous ulceration of the vulva, which was cured by local and general treatment. A year later her toe was amputated for tuberculous dactylitis, and then the nose and lacrymal sac were affected, and later still the pharynx and larynx. During the five years these successive lesions had been developing the child had maintained a healthy appearance. In tuberculous conjunctivitis the large subepithelial nodules leading to ulceration and large granulations were rare.

With regard to the possible tuberculous origin of the common phlyctenular conjunctivitis of children, Veeder and Hempelmann reported, in 1920, 196 cases of phlyctenular disease, and 93 of them gave a positive von Pirquet reaction. In half the cases tuberculous lesions were found in other organs, and of those kept under observation for a year or more four-fifths gave evidence of other tuberculous processes. The President had noticed a type of phlyctenular conjunctivitis which he had come to regard as definitely tuberculous. Occurring mostly in young adults, it was a very chronic type and resistant to ordinary treatment. The phlyctenules were small and closely set, near the corneo-scleral junction, and there was frequently infiltration of the cornea, with invading vessels. Ulceration was very rare. Iritis was sometimes present also. In all the cases there were evidences of tuberculous process elsewhere or there was a family history of susceptibility to the disease. Examination of the tissue and inoculation gave negative results. Immediate and striking benefit followed the use of tuberculin in these cases. Tuberculin B.E. was used, and the initial dose was 1/5000 mg. to 1/10000 mg., according to age. Four-hourly temperature records were taken for 24 hours with the patient in bed. Failing a general

reaction or temperature, an increased dose was given three days later. When the reaction was obtained the dose was repeated, and if there was again a reaction the dose short of this was given, and repeated at weekly or fortnightly intervals, according to the case. He had not had any experience of direct local applications of various dilutions of tuberculin P.T.O. (bovine). Constitutional treatment was of great importance, as also was the searching for and treating any local focus of the disease.

With regard to the possibility of the mediastinal glands being the primary focus in cases of toxin infection of the eye, Prof. Stewart had supplied him with some important observations. In 100 cases of death from rapidly fatal war injuries on men of good physique there was evidence of tuberculous disease in 42 per cent., in 11 per cent. scarring at the apices of the lungs, and in 1 per cent. extensive old pleuritic adhesions. In 32 of the 100 there were signs of glandular infection; hence it seemed the primary focus in these cases of tuberculo-toxin might be the bronchial and other glands. Excision of the affected conjunctiva in some cases was tried, but without specially satisfactory results. The best results seemed to follow if a strip of conjunctiva 2 or 3 mm. in width were excised all round the corneo-scleral junction, and the larger superficial vessels, involving the cornea, carefully scarified by the point of a Graefe knife. The value of peritomy had been emphasised by several ophthalmic surgeons, and he believed it to be one of the most valuable aids extant. Tuberculous keratitis following infection after injury he regarded as rare, as also was secondary infection from the conjunctiva, the ciliary body, or the iris. In his experience, peritomy was of the greatest value in the treatment of the pannus of tuberculous keratitis, though it was valueless in congenital syphilitic keratitis; but the possibility of a mixed infection must always be remembered.

Mr. N. BISHOP HARMAN read a paper on

Standards of Vision for Scholars and Teachers in Council Schools.

He said the teacher's life was, in his view, a hard one, and short hours and good holidays did not ensure against risk of strain to normal eyes. This risk was increased in cases having an ocular defect. The teacher's work, of course, was not limited to the energy expended in the class-room, as there was much preparation to be carried out. In good schools there was also a large social element, the organisation of which fell to the teachers in State schools. The State had provided an "educational ladder," rungs of which were scholarships, college, and university training. It was a necessary corollary of this provision that the recipient of these advantages should have the physique to enable him or her to benefit by them. The absence of such physique meant wastage, and the physical failures probably kept out better candidates. There were tests of vision in existence, but there was a real need for these tests to be standardised. Otherwise a teacher trained in one area might be refused in another, an undesirable anomaly. Trained teachers should be freely interchangeable.

Recently Mr. Harman had adduced evidence of the disability due to defective vision in myopes. It was found in that investigation that myopes of 3 D. to 5 D. who were engaged in continuous close work showed failure in work to the extent of 33 per cent.; those from 5 D. to 10 D. to the extent of 60 per cent.; and those over 10 D. to 77 per cent. The whole of these myopes showed a failure of 53 per cent., whereas myopes of the same order who did not engage in continuous close work failed only to the extent of 9·4 per cent. On this basis the author had worked out a table of standards, which he now submitted to the section for consideration and discussion. Starting with the allowable margin of error in teachers at the age of 21, the difference was estimated for the children at the age of 11.

Mr. Harman had given consideration to a number of possible defects due to odd eyes, old inflammations resulting in scarred eyes, &c., also amblyopia from squint and defects of colour vision. Difficulty might sometimes arise in the disbarring of young myopes who were alleged by their teachers to be "brilliant," but these reports should not be considered too seriously. Myopes devoted an undue amount of time to close work because the defect of sight presented a handicap in games, yet the all-round candidate with better sight might be the better in the long run. The 2 D. difference between teacher and junior scholar in the allowable degree of myopia was none too much for ten years of hard study between the eleventh and twenty-first years, which were also the most critical years of development. In such cases it was better, in the interests of both the candidates and the teaching service, to divert their energies to safer channels at an early age. There were now trade scholarships, entailing but little strain on the eyes.

Table of Standards.

(a) *Hypermetropia.*

Candidates.	Age.	Sphere	Cylinder.	Sphero-cylinder.
All.	11–21	5 D.	4 D.	Average of four meridians = 5; as. not over 3 D., e.g., +3·5 D. sph. c. +3 D. cyl.

(b) *Myopia, with Mixed Astigmatism.*

Candidates.	Age.	Sphere	Cylinder.	Sphero-cylinder.
Teacherships	21	5 D.	4 D.	As in hypermetropia.
Senior scholars	16	4 D.	3 D.	Average of four meridians = 4; as. not over 3 D., e.g., −3 D. sph. c. −2 D. cyl.
Junior scholars	11	3 D.	3 D.	Average = 3 D.; as. 2 D., e.g., −2 D. sph. c. −2 D. cyl.

Discussion.

Mr. ERNEST CLARKE pointed out the difficulties which would be encountered in practice in carrying out what Mr. Harman advocated, and especially the difficulty of setting a standard for hypermetropia. Much depended on the supply and demand. If there were many candidates the standard could be high, but not if there were a paucity of applicants.

Mr. INGLIS POLLOCK summarised the position in Glasgow, where if a child had increasing myopia he was allowed to go on and enter the teaching profession but was excluded from the benefits of the superannuation fund.

Mr. HARRISON BUTLER pleaded for discretion, and thought an opinion should not be given on a myope until he or she had been under observation two years. Some authorities held that the progress of myopia had nothing to do with engaging in near work.

Dr. F. C. SHRUBSALL spoke from the standpoint of the medical officer of schools, and urged the adoption of some such standard as Mr. Harman recommended.

A resolution was agreed to that the Council of British Ophthalmologists be asked to consider the recommendation of a visual standard on the lines urged by Mr. Harman.

Exhibition of Cases.

Dr. RAYNER BATTEN showed a man who, following an accident to his right eye, developed a white deposit on the edge of his iris, which looked almost crystalline, and was probably calcareous.

Dr. J. A. VALENTINE exhibited a patient aged 26 with a cyst of the retina. She had 2 D. of myopic astigmatism, and the axis was down and out 15°. Cysticercus seemed probable, but no confirmation was forthcoming.

Mr. TREACHER COLLINS agreed with the diagnosis, and said it was very unusual to see the condition ophthalmoscopically.

Mr. WILLIAMSON-NOBLE'S case was one of angeioid streaks in the retina. The patient had a positive complement-fixation reaction to tubercle. Mr. Williamson-Noble also exhibited an ingenious plane glass retinoscope, which the President said possessed great possibilities, especially when the promised further developments were brought about.

MEDICAL SOCIETY OF LONDON.

A MEETING of this Society was held on Oct. 16th, when the presidential address on

Certain Developments in Medicine

was given by Lord DAWSON OF PENN, and will be found in the front of this issue of THE LANCET.

Discussion.

Sir HUMPHRY ROLLESTON remarked on the broad views expressed by the President in his address, and said that he arose to propose a vote of thanks rather than to discuss what the President had said. While the wear and tear of modern life had occasioned many changes in habits of thought and the manner of life, it was still an open question whether they were responsible for altering the type of disease. In reading a very old medical book recently he had been struck by the description of symptoms which now would be described as typical of neurasthenia. As regards psycho-analysis, Freud's teaching had been distorted by those psycho-analysts who sought to find a basis in sex for all mental ailments. The want of proper hospital treatment on a paying basis for people of the middle classes was universally recognised by the medical profession, but the establishing of such hospitals was a difficult problem.

Sir JOHN BROADBENT, in seconding the vote of thanks, said that the Society had had evidence in the President's address that in spite of many temptations to become a politician Lord Dawson remained faithful to the profession of medicine. The psycho-analysts, he feared, preyed upon the faith of their patients—that faith which had been defined as the quality of believing what one knows is not true.

Dr. L. WAINWRIGHT remarked on the influence of mind over matter. Medical literature abounded with instances of illness caused by the suggestion of friends; and patients who had come to him after being "psycho-analysed" appeared to him to have become introspective monomaniacs.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE annual meeting of the Society was held on Oct. 20th, at 1, Upper Montague-street, London, W.C., when Prof. T. EUSTACE HILL was installed as President. A vote of thanks to Dr. W. J. Howarth, the outgoing President, was passed on the motion of Prof. A. BOSTOCK HILL, seconded by Dr. HERBERT JONES. Fifty-seven new members were elected.

THE PUBLIC HEALTH: SOME POINTS AS TO ITS PROGRESS AND HINDRANCES.

Prof. EUSTACE HILL then delivered his presidential address with this title. He said that the objects and future of preventive medicine had been ably summarised from time to time by Sir George Newman, and that if his reports were more widely read and acted upon, not only by the medical profession but also by the general public, the greatest benefit would follow. Ten years ago Prof. E. W. Hope, in his presidential address, had claimed that the phenomenal results of sanitary administration in this country deserved much closer public attention than they received, and this statement applied with even greater force to-day, when the necessity for economy was prompting many local authorities to lessen expenditure on essential public services, and among other things to reduce the already grossly inadequate salaries of their public health officers. He agreed that public money should be wisely spent, and only when a good return in improved health was practically certain. But, unfortunately, some authorities did not take a long view. The majority of members of local bodies did not appreciate the improvement in the public health, and did not understand vital statistics, nor what was implied by a reduction in the death-rate. Prof. Hill presented figures showing for England and Wales certain death-rates in 1921 as compared with the annual rates in the decennium 1881–85.

Year.	Per 1000 population.				Per 1000 births.
	All deaths	Deaths from—			Infantile mortality.
		Tuber-culosis.	Enteric fever.	Diarrhœal diseases.	
1881–85 ..	19·4	2·54	0·22	0·64*	139
1921	12·1	1·13	0·016	0·45	83

* Quinquennium 1891–95.

The reduction in the death-rates in the last 25 years represented a saving of over 900,000 in England and Wales in the last five years alone, including 225,000 infants.

The Decline in the Death-rates from Tuberculosis, Enteric, and Diarrhœal Disease.

With regard to *tuberculosis*, since 1881–85 the mortality had been reduced to less than one-half. None the less, the efforts to grapple with this disease in the last ten years had been concentrated on its treatment rather than on the causes which produced it. Its reduction was the result of the betterment in industrial conditions and in the education and social life of the community. Effectually to control the disease we must comprehensively deal with the housing problem and ensure that our milk-supply does not disseminate germs. Prof. Hill was satisfied that our schemes of sanatoria, hospitals, and dispensaries were on right lines, and in fact indispensable; but in many industrial districts expenditure on sanatorium treatment, except for segregation purposes, was not remunerative in view of the evil conditions to which the patients had to return. Expenditure on sanatoria might have been more advantageously devoted to improving the housing of the people, but he was doubtful whether the money, if not spent on tuberculosis schemes, would have been utilised for the other purpose. Prof. Hill laid great stress on the need for housing improvement. In the county of Durham in 1911 over 28 per cent. of the dwellings were overcrowded, and conditions were now worse than at that time. The 200,000 houses to be provided throughout the country, according to the Government scheme, only touched the fringe of the problem.

One of the most satisfactory features of recent vital statistics was the decline in *enteric fever*, the mortality from which was less than one-tenth of what it was 40 years ago; it was remarkable that this applied in certain districts where the ash-privy or pail system of disposal, and bad sanitary environment, still prevailed. The serious water-borne epidemic last year at Bolton-upon-Dearne, Yorks, did not support the view that the virulence of the disease had lessened, and he was inclined to attribute the decline in the prevalence of enteric fever to the better education and habits of the people. The death-rate from epidemic diarrhœa had also decreased considerably, and this he attributed to the attention which had been devoted to maternity and child welfare. He contrasted the behaviour of the disease in the two hot and dry years 1911 and 1921. In the third quarter of 1911 the diarrhœal deaths in Durham administrative county numbered 1347, and only 302 in the corresponding quarter of 1921. There had certainly been no material improvement in sanitary circumstances, and he had no doubt that this saving of a thousand lives of young children was the direct result of the maternity and child welfare work, which had not commenced in 1911.

Reduction in the Mortality of Infants.

Prof. Hill then considered the reduction that had taken place in the mortality of infants under one year of age. This had been more marked between the ages of three and 12 months than at ages under three

months, and the most notable reductions were in deaths due to diarrhœal diseases and tuberculosis. There had been no reduction in mortality from premature birth, and only a small reduction in that from acute lung diseases. The reduction in infantile mortality was less in Durham than in other counties, and this was attributable to the serious overcrowding of dwellings. Much of our present infant mortality was preventable, and one of the most serious environmental causes was overcrowding. Yet he did not believe that in also concentrating on the individual we were taking the wrong turning in public health, nor lessening individual responsibility. There was still much ignorance on the part of the average mother, and it was important that well-educated health visitors should get into touch with the mothers in the home. Only a comparatively small number of mothers outside the large centres of population could take advantage of welfare centres and similar agencies. Much of the family income of the working classes was wastefully expended on food, owing to lack of knowledge of food-values and the proper preparation of food, and in the purchase of clothing, furniture, &c., money was often badly laid out. Few working mothers gave sufficient attention to their own health during pregnancy. Both maternal and infant mortality were favourably influenced in districts where there was an efficient midwifery service. A trained midwife or maternity nurse should attend every confinement, even if a doctor were present, to ensure proper nursing during the lying-in period. In the county of Durham last year 10 per cent. of births took place without a doctor or midwife being in attendance. There was often a prejudice against the modern trained midwife in favour of the handy-woman, and in some districts, unfortunately, medical men opposed the introduction of a trained midwife.

The Inter-dependence of the Curative and Preventive Branches of Medicine.

This had received much attention in recent years, as well as the relation of the medical practitioner to the public health officer. It was gratifying to know that closer relations would be encouraged by the coöperation of the Society of Medical Officers of Health with the British Medical Association. Dr. Addison had said, "If society had had available in some practical form during the last 50 years the guidance of the medical profession in the prevention of disease, a much larger advance towards national fitness would by now have been made." It was hoped that much improvement would be effected by the greater attention to the principles of preventive medicine in the training of medical students, foreshadowed by the recent resolutions of the General Medical Council. Prof. Hill referred to a dangerous tendency to rely on bacteriological reports instead of clinical evidence in the diagnosis of diphtheria, and to delay the administration of antitoxin; improvement in these respects would greatly reduce diphtherial mortality. In the notification of births, of pulmonary tuberculosis, and of ophthalmia neonatorum some practitioners were notoriously slack. Doctors could exert a powerful influence in the promotion of an efficient midwifery service. Prof. Hill referred to the valuable report of the Medico-Sociological Committee of the British Medical Association on the Value of Maternity and Child Welfare Work in Relation to the Reduction of Infant Mortality, issued in 1920. He welcomed its reference to the need for a better service of midwives and maternity nurses, and said that it was a reproach to this country that there had been very little decline in the last 20 years in maternity mortality and a tendency for deaths from puerperal sepsis to increase.

In conclusion, Prof. Hill urged that only wise and well-considered schemes affecting the welfare of the community should be encouraged by the medical profession. Disease produced by insanitary surroundings and neglect of personal health took its toll both of the virile and the weakly, and by its prejudicial influence on the parents led to the birth of weakly infants. He suggested that a policy of dealing with surplus population by emigration to our colonies was in every way superior to the policy advocating the general use of contraceptives. Prof. Hill urged a continuance of our efforts to obtain an accurate knowledge of the causes of disease, and our policy of personal education and the improvement of environment.

THE ADVANCE OF PREVENTIVE MEDICINE.

Sir GEORGE NEWMAN, in moving a vote of thanks to the President, said that the right turning had been taken in combining the two great aspects of preventive medicine—viz., the environmental and the personal. The pendulum swung from time to time between these two sides, and a right and natural evolution had taken place in their work. The results had been astounding, and he remained deeply hopeful. They perceived enormous advances in recent decades, and public opinion had doubtless been fostered to a large extent by the members of the Society. The fall in enteric mortality was a remarkable triumph; so was the decline in infantile mortality. The new-born child was now ensured of an increase of 12 years in its average expectation of life over that of its grandparents' generation.

Dr. HOWARTH, in seconding the vote of thanks, said that unsound advocacy on public health questions made great difficulties for public health officers, and their personal decision on such matters was of great importance. He referred to the fact that Dr. Alfred Hill and Dr. Bostock Hill, the father and brother of Dr. Eustace Hill, had occupied the presidential chair of the Society before him; and he also welcomed Sir George Newman and spoke of the great esteem in which he was held by his fellow-members.

NORWICH MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Oct. 10th at the Norfolk and Norwich Hospital. The chair was occupied by Dr. ARTHUR CROOK, the newly elected President.

Dr. HUGH THURSFIELD (London) gave an address on the

Treatment of Empyema in Infants and Young Children.

He said that the mortality rate from this disease in young children was a good deal higher than most of them imagined. Holt gave it as 74 per cent. in the first year of life, and 59 per cent. in the second year, and after the second year 13 per cent. At Great Ormond-street it was 76 per cent. in the first year and 46 per cent. in the second. But there was another thing besides the mortality rate with which they were dissatisfied—viz., the lengthy period of convalescence in successful cases, which averaged two months. He wished to deal with those two points. How were they to diminish the mortality rate and shorten the long period of convalescence?

He divided the causes of high mortality into three groups: 1. A group of cases in which the condition of the infant was so bad that operation was out of the question. The only chance of improvement in the mortality rate in this group was earlier and more efficient diagnosis. 2. Cases in which the empyema was merely a part of a widely diffused infection, in which there was not much hope of improvement, as the mortality was due to the primary disease,—e.g., measles, septicæmia, or chronic pyæmia. 3. In this group the children succumbed after an apparently successful operation, usually from fresh infection of the pleural cavity. The two main causes of mortality were want of skill in diagnosis and failure of the patient's powers of resistance to infection. With regard to diagnosis, it should be remembered that in infants the signs by which one diagnosed empyema were often absent. In Dr. Thursfield's opinion failure to use an exploring needle in doubtful cases was responsible for much faulty diagnosis.

Improvement in treatment of empyema was necessary if the mortality was to be diminished. The accepted method of treatment was by resection of one

or more ribs and drainage. In his opinion resection of ribs should never be performed in young children, for the following reasons: (1) A general anæsthetic was indispensable for this operation, and anæsthesia weighed the balance against recovery in weakly infants; (2) the operation involved opening the pleural cavity, with the risk of secondary infection; (3) the frequent changes of dressings necessary were very exhausting; (4) the skin wound was apt to become infected; (5) there was a danger of osteo-myelitis of the rib.

What, then, were the alternatives to rib resection? They were: (*a*) simple aspiration; (*b*) continuous drainage without opening the pleural cavity; and (*c*) incision of an intercostal space without resection of a rib, but with various modifications.

Simple Aspiration.—This was sometimes completely successful. It had been advocated some years ago by the late Dr. Samuel West who quoted many cases of paracentesis which had required no further treatment. But owing to the difficulty of determining what cases could be relieved by simple aspiration alone, and because the results of insufficient evacuation were unsatisfactory, the method had deservedly fallen into disrepute.

Continuous Drainage.—Dr. Thursfield considered that in suitable cases, when the lung was not bound down by firm adhesions, this method approached the ideal, as it emptied the pleural cavity without exposing it to infection from without, it exercised a gentle suction on the collapsed lung, and it avoided the bugbear of repeated dressings. He described the essential points of the apparatus devised by Dr. F. J. Poynton and Dr. Reynolds, in which air-tight communication between the chest cavity and the pump was secured by using a cannula of a little more than half an inch in length, just sufficient to lie inside the pleural cavity; over this a rubber tube 10 inches long of a diameter slightly larger than the cannula was stretched upon a metal introducer until it was so narrowed as to pass into the cannula; when the introducer was withdrawn the expansion of the rubber so fitted the cannula as to prevent air passing between the tube and cannula; the tube was then joined to a Sprengel's water drip pump, by means of which the pus was evacuated.

Incision Without Resection of a Rib.—This method had been recently revived with various modifications, and in certain conditions it was probably the method of choice. The ideal would be simple incision, evacuation of the pus and primary suture, but this was rarely successful. One of the best modifications was simple incision and the emptying of the abscess, followed by suture of the greater part of the wound, but leaving a folded piece of protective as a drain for the first 24 hours, after which period the pleura might as a rule be trusted to deal with any material which might collect. He believed indeed that the pleural membrane was much more efficient as a scavenger than they had been led to think.

As to the choice of these various methods of treatment Dr. Thursfield laid down the proposition that in recent empyemata rib resection must be avoided at all costs, and that it was rarely necessary and never advisable to explore the pleural cavity with the fingers. When there was reason to suppose that there were extensive adhesions of the lung so that it could not expand, as in cases where the empyema had existed for many weeks, then resection and exploration of the whole cavity was necessary; but fortunately such cases were rare. In the case of young infants the method of continuous drainage had so many advantages in the avoidance of a general anæsthetic and of frequent dressings that he thought there could be no hesitation in adopting it in the majority of cases. In older children he did not feel sure that it had any advantage over simple incision with drainage for 24 hours. Either method had at any rate the great advantage of economy of the time consumed in convalescence.

Dr. Thursfield concluded with some observations about the pathology of the disease. If when pus was discovered with the exploring needle films were made and stained at once, some idea of the reaction of the pleural tissues to the infection could be obtained. In a recent case, for instance, in a child who had had pneumonia and in whom the signs suggested the possibility of an empyema, the turbid fluid removed by the exploring needle was found to contain a large number of pus cells, but there were scarcely any organisms present—only a few cocci, mostly intracellular. He decided that the pleura was dealing efficiently with the infection and did not advise operation, with the result that the child was ready to leave the hospital within ten days. If, on the other hand, the organisms were numerous and there was little evidence of phagocytosis it was clear that evacuation of the pus was required; if the pus was thin and sanious it was clear that drainage would be required; if, on the contrary, it was creamy and so-called "laudable pus" it was probable that simple evacuation would do all that was necessary. The nature of the organisms was also of importance. The pneumococcus was generally, but with notable exceptions, an inoffensive creature; the streptococcus and the rarer staphylococcus were much more dangerous. In either case he believed that one could do a good deal to help the patient by using sensitised vaccines. Evidence of the efficacy of vaccines was convincing, and in any patient who was at all ill he would give doses of sensitised vaccines for at least two or three days.

Discussion.

Dr. F. W. BURTON-FANNING agreed that surgeons as a rule were too fond of the operation of rib resection. When he was house physician at Addenbrooke's Hospital, Cambridge, empyemata used to be treated by incision with drainage, but without resection of a rib, and the cases did extremely well. In no case had he seen a successful result from incision with immediate closure of the wound without drainage. It was often a difficult question to decide whether the fluid removed by the exploring needle was pus or only turbid fluid. He had no faith in treatment by vaccines.

Dr. S. BURTON remarked that the results of treatment at the present day seemed to be more satisfactory than they used to be.

Dr. W. WYLLYS expressed himself in favour of vaccine treatment.

Dr. S. LONG advocated aspiration before calling in a surgeon to operate. In some cases no further operation was required, and if subsequent operation was necessary, the preliminary aspiration was of benefit.

Dr. MUIR EVANS commented on the rarity of empyema in children in Lowestoft. The figures for a number of years in the Lowestoft Hospital showed an average of one patient in two years. Other speakers also commented on the rarity of the disease in young children in Norfolk.

Mr. A. J. BLAXLAND, Mr. N. S. CARRUTHERS, and Mr. J. BURFIELD also spoke, and Dr. THURSFIELD replied.

LIVERPOOL MEDICAL INSTITUTION.

THE inaugural meeting of the session was held at the Medical Institution on Oct. 19th, with Prof. J. HILL ABRAM, the President, in the chair.

The PRESIDENT delivered an address on

The Medical Curriculum.

He expressed the view that a closer correlation should be sought between the various subjects of the student's course from the commencement of his study of the first year's subjects, through the intermediate period, to the clinical instruction of the later years. He considered it vitally important to free the student during his last three years for the unhampered study of medicine, surgery, and obstetrics. He believed, also, that examinations in the subjects studied during these years should be held only at the end of the fifth year. The burden of examinations needed lightening, and he hoped that, in the new changes in the curriculum which were about to be made, this point would not be lost sight of.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.

Exhibition of Cases and Specimens.

THE opening meeting of this session was held at the Miller General Hospital, Greenwich, on Oct. 13th, DR. E. W. FARMER presiding until Dr. W. H. PAYNE was elected President for the year and took the chair.

Mr. C. A. JOLL showed (1) a young woman, previously shown before the Society in January, on whom he had operated for a myeloma of the upper end of the humerus, the head of which was destroyed. A free graft from the upper two-thirds of the fibula was used. The graft persists and functions as was shown by X ray plate. (2) A boy with enlarged glands of the neck, probably tuberculous, with a septic element.

Dr. H. PRITCHARD showed a case of ascites in a female with mitral disease. The heart condition developed 18 years ago after rheumatism. The patient had been tapped 24 times in 21 months, the amount of fluid taken varying from 14½ to 20 pints.

Dr. A. S. WOODWARK showed (1) a man with ascites, who had been tapped 17 times since Nov. 15th, 1921. He had albuminuria, aortic regurgitation, and hypertrophy of the heart. He had clubbed fingers and enlarged spleen; 18½ pints was the average quantity removed. (2) A youth with Graves's disease, tachycardia, and aortic regurgitation. He had undergone X ray treatment, bromide treatment, fat-free diet, with an ounce of cod-liver oil daily. An X ray plate from a case of gastric ulcer was shown, taken by Dr. J. P. Bracken.

Mr. CAIN, on behalf of Mr. H. Davies, showed a case of pseudo-elephantiasis, from which a wedge-shaped piece of tissue had been removed. The disease did not extend below the ankle.

Reviews and Notices of Books.

CANCER AND ITS NON-SURGICAL TREATMENT.

By L. DUNCAN BULKELEY, A.M., M.D., Senior Physician to the New York Skin and Cancer Hospital; Member of the American Association for Cancer Research. New York: William Wood and Co. 1921. Pp. 457. 6s.

THE author of this book has brought together a large quantity of statistical information, pathological observations, and physiological speculation with a view to recommending to the medical world a theory of cancer which he believes to be the right one. He regards the disease as a "constitutional" one (as distinct from a local one), in the same way that gout and rickets are constitutional. Something goes wrong somewhere with the smooth interaction of physiological processes, and as a result a condition of "carcinosis" results, leading incidentally but specifically to the deposition of a neoplastic formation. Excepting this neoplastic symptom, it will be observed that the "theory" might be held to account for most diseases or even for disease itself; but here Dr. Bulkeley takes a step into the unknown, and, fastening upon certain "declared" evils—alcohol, meat, tea, coffee, constipation, irregular habits, lack of sunlight, and faulty ventilation and drainage—as the disturbers of the physiological harmony, he lays down an appropriate dietary treatment compiled with an exactitude of caloric value comparable to that required by Dr. Allen for diabetics. He demands a complete intestinal evacuation every day, regular and hygienic habits, a cheerful optimism, occasional and varied medical adjuvants such as extract of thyroid internally, and an ichthyol-containing paint to be applied to the neoplastic deposit.

So far (Chapters I. to XVII. and XIX.) the volume is speculative in character and in such work it is unfair perhaps to insist too much upon a logical method. Still we must be excused for pointing out such easy transitions of thought as one occurring on p. 84, where the "suggestion" that "after the age of 40 more of the products of katabolism .... exist in the body-fluids" is quoted only two lines later as "a fact incidental to the cancer period." It is also surprising that persons whose health is so undermined by "carcinosis" as to have carcinoma also should be "ruddy and blooming" in appearance (p. 324). In another place (p. 211) we are told that "alcohol has been shown to be undoubtedly an element contributory to the causation of cancer"; now an exposition of the proof would interest us more than this emphatic declaration. On the subject of the rarity of multiple primary cancer Dr. Bulkeley is very reticent. This remarkable feature of the disease goes far to contradict his theory, and he is able only to describe at some length a single case of double primary cancer.

From the scientific point of view, where fact is supreme, Chapter XVIII. is this volume's contribution, and it occupies one-quarter of it, containing descriptions of 91 cases calculated to show the wonderful results obtained by the "non-surgical" treatment quoted above; many cases of cure and many others of improvement are recorded in patients suffering from cancer. Of this work we can only say that in the scientific world it is not sufficient to record, it is necessary also to demonstrate, and that without the evidence of confirmation of his observations by qualified independent observers—clinical or pathological—Dr. Bulkeley will hardly be able to influence the opinion of the members of a profession whose instinct is to insist upon the scientific analysis, as far as may be, of any case of declared cure of cancer. One corroborated case of cure, showing microscopic evidence of the disease, and existing side by side with the patient in good health year after year, would persuade more than the records of these 91 cases.

ENCYCLOPÆDIA MEDICA.

Second edition. Under the general editorship of J. W. BALLANTYNE, M.D., C.M., F.R.C.P.E. Vol. VIII., Labyrinth to Mammary Gland. London and Edinburgh: W. Green and Son. 1922. Pp. 704. 30s.

THIS second edition of the Encyclopædia Medica is a well-revised and in many parts rewritten issue of the work which first appeared a score of years ago. This volume contains a number of articles on the larynx which we select for notice on the principle of sampling. The articles begin with a description of the examination of the organ by Dr. J. M. Hunt, revised by Dr. Douglas Guthrie, which includes indirect and direct laryngoscopy, suspension laryngoscopy, tracheo- and bronchoscopy, and œsophagoscopy; we notice that while the examiner is directed to hold the tongue between the thumb and forefinger, in the illustration the better way is depicted of using the thumb and second finger for this purpose, leaving the forefinger free to steady the head and retract the upper lip. The same authors supply a good and thorough account of benign growths, though in describing their removal by indirect laryngoscopy the method of applying cocaine to the larynx, so important for success, has not been discussed. Sir StClair Thomson supplies a useful article on acute and chronic inflammations. The most interesting of all is that on malignant disease by the late Sir Felix Semon—it is a subject on which he did great and original work and had unique experience; the differential diagnosis is treated in a masterly manner and the article has been well revised by Dr. Patrick Watson-Williams, who also deals with neuroses of the larynx, and discusses thoroughly the causation of laryngeal paralyses, a matter of general diagnostic importance. For no apparent reason an article on hypertrophy of the lingual tonsil is included in this section. Dr. Logan Turner provides a description of perichondritis which may be thought long, considering

the rarity of the disease, but it is exactly where clinical experience is scanty that full assistance is wanted. An article by Dr. John Thomson on congenital laryngeal stridor is a lucid exposition of his views on a rather obscure subject; he believes that there is a defect in development of the cortical respiratory centres, the effect of which is only enhanced by the soft collapsible character of the upper aperture normal in infants; however, since direct laryngoscopy has facilitated examination of young infants, it has apparently been proved that there is a definite congenital defect in these cases, an exaggeration of the normal infantile shape which reduces the upper aperture to a slit. Dr. Thomson also provides a clear description of laryngismus stridulus. There is no account of syphilis of the larynx, while an article on tuberculous laryngitis, under the section on the lungs, by Dr. A. F. Hewat, is disappointing to the laryngologist. It does not contain a sufficiently close description of the laryngeal lesions to be greatly helpful in diagnosing the condition, and includes but a cursory account of local treatment.

Though the standard of articles varies, this volume will be widely useful for reference.

PULMONARY TUBERCULOSIS.

Third edition. By MAURICE FISHBERG, M.D., Clinical Professor of Medicine, University and Bellevue Hospital Medical College, &c. London: Henry Kimpton. 1922. Pp. 891. 42*s*.

A NEW edition of Prof. Fishberg's "Pulmonary Tuberculosis" is something of an event. It is not a very rare event; during the past five years two editions have been exhausted. But the first two editions have made such a place for this work in the Anglo-Saxon countries that they have given a foretaste for the third edition. The reader is not likely to be disappointed, though, if he is already an expert on tuberculosis, he will, perhaps, find much in this book with which to disagree. Prof. Fishberg has a turn for unorthodox and unconventional views—an attitude provocative of hard thinking and occasional revision of traditional dogmas. Considering the captious and critical spirit of the age, it is a pity that he does not always give chapter and verse, or, better still, statistical proof from his own observations, in support of his views when they are of a possibly heterodox complexion. For instance, he states (p. 588) that tuberculous patients only rarely suffer from the acute and epidemic infections of the nose and throat, and that the subjects of acute or chronic progressive phthisis usually escape when other members of their families are stricken. Acute coryza, he maintains, runs a mild course in these patients, hardly inconveniencing them. "Clinical experience has taught that it is extremely rare that phthisis should begin with manifestations of an acute inflammatory process of the nose and throat." Before this statement is challenged it would be advisable to ascertain the sense in which the author uses the word *begin*. If he refers to the stage at which the practitioner first diagnoses tuberculosis, we would join issue with him, for at this stage and in this country a recent history of an acute infection of the nose and throat is common. Let it be noted that the author has worked in a climate different from ours (as an American visitor to this country once remarked: "You have no climate, only samples"). It would also have been well had the author given evidence in support of his opinion that the surgical removal of the tonsils, in cases of mild tuberculosis of the lungs, often gives an acute and progressive turn to the disease; "especially the larynx is liable to become implicated in the tuberculous process soon after the operation." Is this the experience of British laryngologists?

A new and interesting chapter is on the interrelation of pulmonary tuberculosis and other pathological conditions. The association of tuberculosis with other diseases has often been discussed, but in the past few systematic attempts have been made to study thoroughly the likes and dislikes of the tubercle bacillus for other germs and morbid processes due to disturbances of metabolism. This section might be expanded in the next edition. Another new chapter is devoted to the medico-legal and insurance aspects of tuberculosis. Too often a new edition is little more than a reprint, but in this case the entire book has been reset and radical changes have been made in nearly all the chapters, some of which have been rewritten. This is all to the good, for it would scarcely be an exaggeration to say that our knowledge of tuberculosis is increasing by leaps and bounds, and we are not only forced to revise much of the teachings of only a decade back, but we are also having to acquire much new and hopeful knowledge in this field.

Études cliniques et radiologiques sur les maladies de l'appareil respiratoire. By ÉMILE SERGENT, Professeur de Clinique Médicale Propédeutique Médecin de la Charité, Membre de l'Académie de Médecine. Paris: A. Maloine et Fils. 1922. Pp. 520. Fr.25.

Prof. Sergent's book is an interesting hybrid, difficult to classify. The first part, dealing with the clinical aspect of diseases of the respiratory system, is largely made up of a collection of papers previously published. The feature of this part which makes it of particular value to the specialist is that he does not attempt to cover the whole field and follow the traditional lines of the conventional text-book, but that he devotes ample space to a few questions, the answers to which are to a considerable extent to be found in his own investigations. Thus he gives a long and interesting account of the diagnostic value of inequality of the pupils in pulmonary tuberculosis, the significance of spontaneous or provoked inequality of the pupils being discussed clearly and fully. Another subject on which the author lets himself go is that of the relation between pulmonary tuberculosis and syphilis, and the possibility of serous pleural effusions being due, in a certain proportion of cases, to the *Spirochæta pallida*. When, however, we turn to the second part, Prof. Sergent is found playing the rôle of the systematic teacher taking a class of students with only an elementary knowledge of radiology in relation to the respiratory system. As he points out, if radiology is to be of diagnostic service to the physician, it is essential that he masters its A, B, C. Whether Prof. Sergent is dealing with clinical finesses, as he does in the first part of his work, or with the elements of the radiological examination of the chest, as he does in the second part, he is invariably lucid and informative.

INDEXED SYSTEM OF VETERINARY TREATMENT.

A Work on Modern Medical, Surgical, and Biological Therapy. By WILLIAM SCOTT, F.R.C.V.S., F.R.S.M., F.R.M.S., with the Collaboration of Various Writers. London: Baillière, Tindall and Cox. 1922. With 195 figures in the text. Pp. 636. 31*s*. 6*d*.

To the busy veterinary practitioner this dictionary of treatment will be welcome, and to the student of comparative medicine it ought to be interesting. The author dedicates his book to Sir Clifford Allbutt, who contributes a prefatory note to the work. The matter is quite up to date, and the prescriptions are simple and adequate. Mr. Scott breaks new ground as far as veterinary literature on treatment in this country is concerned. He has done his work well and has been fortunate in his collaborators. The section on Parasitic Diseases, by A. W. Noel Pillers, F.R.C.V.S., is especially lucid and comprehensive, written by one who has spent years in the study of parasites in animals. The list of maladies described is reasonably full. We notice a few omissions, notably of grass disease, botulism, malignant catarrh of sheep,

and ptomaine poisoning. As to methods of castration, the Italian way of dealing with bovines might with advantage have been mentioned, and the castrator illustrated. The formalin treatment of mammitis might have been worth recording as one which has recently been favourably commented on both in America and in this country. A section on diseases of camels and one on the common ailments of fowls are specially useful. The book is well produced.

VACCINS ET SÉRUMS.

By Dr. APERT, Médecin de l'Hôpital des "Enfants Malades." Paris: Ernest Flammarion. 1922. Pp. 282. Fr.7.50.

THE publishing house of Flammarion has prepared a series of medical works under the general editorship of Dr. Apert, with the title of "Bibliothèque des connaissances médicales." The aim of the series is the production of volumes dealing with medical subjects of general interest, written in language which is sufficiently free from technical medical terms to make the books intelligible to the educated layman. The first work of the series on vaccines and serums is written by Dr. Apert himself. The author has certainly set a good standard; his book is clearly and concisely written, laboratory details are given only where absolutely essential, and all doubtful and unproved conclusions are avoided. Due regard is paid to the historical sequence of events in describing the evolution of vaccine and serum therapy. Indeed, the characteristic which impresses us most favourably is the emphasis laid throughout on the historical background of the subject. Bacteriology has grown to its present position of importance by slow and painful stages, and we are apt to forget what a profound debt we owe to some of its pioneers.

If future volumes are as successful as this one, the publishers will have succeeded in demonstrating that the outstanding facts of medical science can be presented to the educated layman in restrained, concise language, without the use of that flamboyant style which has characterised so much of this kind of exposition in the past.

JOURNALS.

BRITISH JOURNAL OF OPHTHALMOLOGY. September and October.—These two issues contain J. Burdon-Cooper's Doyne memorial lecture on the ætiology of cataract, read at the Oxford Ophthalmological Congress last August. "Subcapsular senile cataract is undoubtedly a chemical decomposition of the lento-proteid and the trend of opinion now is that it is more acceptable to regard it as due to alterations in the whole organism rather than to any mechanical explanation based on local causes, and more especially a still unproven contraction of the lento-nucleus." Exactly how the chemical changes are brought about is far from being yet known, but Cooper's investigations go some way in revealing the processes involved. The first change which takes place in the lens in the production of a permanent opacity, he says, is the elementary one of hydrolysis. The detection of tyrosin, one of the cleavage products of the hydrolysed lens substance, led him to this view, but the explanation of the process is obscure. This paper should certainly be read by all interested in the subject.—In the September number T. Harrison Butler discusses the influence of trauma on the onset of interstitial keratitis. His conclusions are as follows: 1. An attack of interstitial keratitis may be precipitated by an accident to a cornea which is disposed to the disease by syphilis or tubercle. 2. It is possible that a very slight trauma, such as the instillation of drops or the irritation of a general anæsthetic, may have the same effect. 3. The attack in the injured eye is liable to be followed by interstitial keratitis in the other eye. 4. It is possible that an injury to one eye may cause interstitial keratitis in the other eye. 5. The question may be asked, "Is it not possible that in every case of interstitial keratitis the attack is precipitated by some slight trauma?" The first and third of these conclusions will command general assent. The remaining ones are more controversial. The influence of trauma, however, as an exciting cause of syphilitic lesions deserves recognition, and it is an interesting question how far this applies, not only to congenital syphilis, but also to the later stages of the acquired disease.—J. Lockhart Gibson, of Brisbane, contributes a paper on papilloedema, in which he discusses its incidence as a symptom of plumbism in children. This has apparently been noted in several cases when the poison of lead has been conveyed by fresh paint on railings to which children have had access.

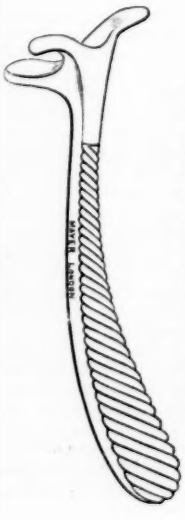
The October number also contains a paper by H. G. A. Gjessing, of Drammen, Norway, on a case of cataracta electrica examined with Gullstrand's slit-lamp. He finds that the characteristics of the opacities with cataracta electrica are the confusion of corkscrew-shaped threads and laces, crossing each other in all directions, without following the regular run of the lens fibres. The same author contributes a paper on the highly technical subject of tonometry.—There are two clinical notes by D. J. Wood, of Cape Town, the first on a case of onyx of long duration, the second on a case of intra-ocular cysticercus.—The number also includes a summary of the third and final report of the Departmental Committee on Lighting in Factories and Workshops.

BOOKS OF REFERENCE.

The Annual Charities Register and Digest, 1922 (London: Longmans, Green and Co., pp. 554, 7*s.* 6*d.*), now in its thirty-first edition, continues to be an indispensable handbook to charities in London or available for Londoners. The volume opens with the usual financial review of the activities of metropolitan charities, and contains detailed information respecting the institutional and other arrangements for dealing with the "afflicted" (blind, deaf and dumb, cripples, lunatics, inebriates, &c.), with the sick, and with those in permanent or temporary distress. Reformatory relief is also dealt with, and a miscellaneous section is devoted to social and physical improvement, employment, emigration, and protection of life and of the helpless. Appended chapters treat of benevolent institutions, trade and friendly societies, registry offices, savings banks, and employment exchanges. A carefully prepared index facilitates quick reference.

New Inventions.

AN IMPROVED AXIS-TRACTION LEVER.



HAVING on several occasions had reason to be dissatisfied with Le Page's tractor, because of its insecure hold on the midwifery forceps, I designed one which appeared to me to be likely to secure a better hold and to be easier of application. The force is exerted on the *shanks* of the forceps, not on the handles, so that the leverage is in the more direct axis, and the instrument is, consequently, more efficient.

Messrs. Mayer and Phelps, of New Cavendish-street, London, have made from my model an instrument which I have had occasion to put to practical use; it answers my expectations in every way.

E. W. W. FARMER, M.D. Brux.
M.R.C.S. Eng., L.S.A.
Lewisham.

THE LANCET.

LONDON: SATURDAY, OCTOBER 28, 1922.

The Insurance Medical Service.

SUFFICIENT unto the day is the evil thereof, and it is the experience of all grades of the community that concentration on the work of the moment gives better results than anxiety for the future. Nevertheless it is natural that some attention should be given to the situation of insurance medical practitioners when the period of compromise arranged with the late Minister of Health runs out at the end of 1923. What may happen on this date, as far as so distant a future can be foreseen, is set down in our report of the Annual Conference of Local Medical and Panel Committees, held in London last week. The Insurance Medical Service never was so well equipped for a fight as it is at the present time, for the fight could not conceivably be a combat to the death with carnal weapons, but would take the polite form of a tourney in which gauntlets are thrown down and a distinguished company of knights and ladies adjudicates; and from day to day the reputation of the service rises in popular esteem. We say this advisedly, although reports have been freely circulating of hard things said against panel practitioners. These statements, as Dr. J. M. BRENNAN, the hon. secretary of the Stockport Panel Committee, has pointed out in an able letter to the *Manchester Guardian*, are not readily susceptible of proof or disproof, for, he writes: "If I were reported in the press as saying that lawyers robbed their clients, or grocers adulterated their food, I should only arouse some resentment and some contempt for myself; but if I brought into a court of justice a fraudulent grocer or lawyer and had him punished on evidence of his guilt, then I should be doing a service to the community." The Insurance Acts provide such a tribunal, the Medical Service Sub-Committee, and Dr. BRENNAN asks critics of the panel practitioner to bring definite charges supported by evidence before that court and to cease to make statements the only effect of which is to create bad feeling among those who should be doing their best to make the Insurance Acts a benefit to the nation.

We have spoken of a fight, which for medical officers in Government employ is not quite the same thing as a private quarrel. There are certain obvious drawbacks inherent in Government jurisdiction. No professional tribunal could possibly have drawn up such a magnitude of interlacing regulations as exist under the Insurance Acts, and we believe it to be a fact that the vast majority of these could immediately be withdrawn, were it not for the half-hearted and backsliding among the insurance practitioners themselves. Purging the list from within, as is suggested in Dr. BRENNAN'S letter, would relieve the Service from the imposition of many conditions which are regarded as humiliating by self-respecting members of an honourable profession. Between the Ministry of Health and the panel practitioner the process of give and take has gone on continuously during the last eight years, and nearly everything felt to be of moment on the one side or the other has gradually been granted by the ordinary processes of negotiation and bargaining. Whether the tourney would afford any speedier prospect of gain is matter for reflection. The panel practitioner would be on the familiar horns of a dilemma; refusal of service, if it resulted in hardship to the community, would alienate public opinion which would be grossly shocked should even a single death occur from neglect of medical help; and, on the other hand, to run a successful alternative service might impale him on the retort: "Since you doctors can run a public medical service so well, do it!" Nor is it easily to be believed that the Government is thirsting for a fight. It is only the junior bureaucrats of approved societies who are obsessed with the idea that a better quality of service for insured persons can really be obtained by means of regulations and exactions. Their desire to cut down sickness benefit in order to pile up surplus funds to increase cash benefits is apparent. It is hidden from them that the only method hitherto known to science of reducing sickness claims is to be found in the furtherance of public health and of measures for the prevention of sickness. A prominent medical officer of health recently likened medical practitioners of to-day to a team acting in the combined interests of patient and community. We must, he said, have greater opportunities for coöperative work; we must recognise one another's functions. The real danger of approved society control is of the layman trying to usurp the rôle of professional adviser and taking action on empirical grounds. Approved society officials failed to understand the failure of sanatorium benefit. To them every case of tubercle was one that ought to be sent to a sanatorium with expectation of cure; any attempt to pick and choose favourable cases was strenuously resisted.

The ultimate court of appeal is the tribunal of well-informed public opinion. The aims and ideals of the Insurance Medical Service, and indeed of the medical profession as a whole, need making clear to the public at the present time. Too little is heard of the good work done every day for the insured population. In many rural centres insured persons undergo major operations at the hands of their panel doctors without extra charge, and numerous services generally regarded as outside the range of medical benefit are provided at the practitioners' expense. A recent appeal of a practitioner to the Minister of Health against the reduction of sick pay to a patient suffering from tuberculosis led to the suspension of the rule in regard to arrears and full benefit being granted. Insurance practitioners are assisting in public health work by providing information through their records, some of which have already been published by the chief medical officer to the Ministry of Health. As the result of a request from the approved societies to the Ministry, a large number of panel practitioners are now keeping special record of rheumatism as a cause of prolonged illness and providing reports for a committee of investigation. The Ministry itself is not unaware of the character of the medical service which it controls.

Immunisation by the Mouth.

OPINION has vacillated strangely in regard to the efficacy of vaccines given by the oral route. At one time a large body of clinical evidence was adduced in support of immunisation by the mouth, but later the mere possibility was questioned in view of the extent to which foreign protein is broken down into amino-acids before absorption by the intestinal mucosa. In 1918 BESREDKA,[1] whilst engaged upon experiments to illustrate the exact conditions requisite for the

[1] Des virus sensibilisés: vaccination antiparatyphique B. By A. Besredka and Mlle. S. Basseches. Annales de l'Institut Pasteur, 1918, xxxii., No. 5.

successful employment of sensitised vaccines, fortunately chanced upon some results which promise to be of the first importance in regard to our conception and practice of artificial immunisation. An attempt had been made to infect mice with *B. paratyphosus* B by the mouth, but the results had been entirely negative even when massive doses of the living organisms were given. At the same time further experiments were going forward in his laboratory in which control animals were inoculated subcutaneously with fatal doses of this organism in order that the degree of resistance of other mice, which had been immunised in various ways, might be compared with that of the normal unprotected animal. Being on one occasion short of mice BESREDKA used as a control one of the animals which had been subjected to the unsuccessful attempt at mouth infection just mentioned. To his surprise he found that the animal remained none the worse for an injection of paratyphoid organisms which was considered surely lethal. On pursuing the matter further this resistance was found to be present in varying degrees in all of the other animals which had received the meal of organisms. The investigator at once realised that he had stumbled across a new fact of great importance, and set himself systematically to study the possibilities of producing immunity by the ingestion of organisms in the case of those diseases where the infecting agent enters the body by the alimentary canal. In the course of some admirably conducted experiments[2] he succeeded in showing that it is possible effectively to immunise animals in this way against subsequent infection, in cases in which the causal organism is able in some degree to invade the intestinal mucosa, or where this intimate relationship can be brought about by artificial means. The immunity thus acquired appears to be special to diseases of this class and to reside, according to the views of the investigator, in the intestinal mucosa; it is thus a local immunity, the vaccinated mucosa opposing a barrier to any passage of organisms, and is independent of the presence of antibodies in the body humours.

Whilst the interest and suggestiveness of these experiments of BESREDKA can hardly be exaggerated, it has been open to doubt how far deductions could be made from the animal to the human subject. The infections with which this work was carried out, dysentery and paratyphoid, are, in animals, only remotely akin to the diseases in man, the animal in general being less susceptible than the human subject. This aspect of the problem has been critically reviewed by NICOLLE and CONSEIL,[3] of Tunis, who have put the matter to the test by experiments upon human volunteers. These workers point out that such experiments can be carried out with reasonable safety in two diseases—Malta fever and bacillary dysentery—which differ widely in character, the one being a septicæmic process and the other a local invasion and necrosis, both being connected by the common feature of having the alimentary canal as the portal of entry of the infecting agent. If, therefore, oral vaccination on BESREDKA'S plan is successful in these two dissimilar diseases it is likely to be applicable to the whole range of intestinal affections. In the case of Malta fever two volunteers were given doses of 100 milliards of dead organisms on three successive days, and a like dose on the fifth day. Fourteen days later these two subjects, with a third untreated volunteer who served as a control, were injected subcutaneously with virulent cultures of the *Micrococcus melitensis*. After 17 days' incubation the control developed a typical attack of Mediterranean fever, with positive blood culture, whilst the two vaccinated subjects remained healthy. In the case of dysentery the inconveniences of subcutaneous or intramuscular injection are well known, the resulting reaction to this toxic organism being so severe as to preclude this procedure as a practicable routine one. Various attempts have been made to modify the vaccines so as to reduce their toxicity, but none of such preparations have found lasting favour, and all are open to the objection that in diminishing the toxicity of the organism there is probably produced a parallel destruction of its immunising capacity. Hence success with the oral route in this infection would be a matter of very great convenience and economic value. In experimenting on this problem NICOLLE and CONSEIL were faced with the difficulty that the natives of Tunis, from whom most of their volunteers were derived, show a high degree of individual resistance to Shiga's bacillus, and hence satisfactorily controlled experiments were hard to arrange. It was found, however, that whilst efforts to infect nine subjects who had been vaccinated by the oral route failed in every case, in 12 unvaccinated subjects three positive infections were obtained. For more definite information recourse was had to European volunteers, four of whom were available. Two of these absorbed 100 milliards of dead organisms per diem for three days, and a similar dose on the fifth day, whilst the other two were untreated. Fifteen or 18 days later all four persons swallowed from 10 to 20 milliards of live virulent Shiga bacilli, with the result that the two controls developed typical attacks of bacillary dysentery whilst the two vaccinated subjects remained undisturbed.

The conclusion from these experiments is that for these diseases, at all events, the method of BESREDKA is efficacious, and that for dysentery it is the only one which can be recommended at the present time. The total number of experiments is small, as it must of necessity be when a rigorous scientific control demands the conveyance of unpleasant, and not dangerless, diseases to human beings, and for the further trial of the method its wide application and statistical investigation are required; but coming from the hands of such experienced and reliable workers as NICOLLE and his collaborator these experiments form a very striking proof of the applicability of BESREDKA'S results to the human race and hold great promise for the future in the prophylaxis of infective intestinal disorders.

[2] Besredka: Annales de l'Institut Pasteur, 1919, xxxiii., No. 5 ff.

[3] Vaccinations préventives par voie digestive chez l'homme dans la dysenterie bacillaire et la fièvre Méditerranéenne. By Ch. Nicolle and E. Conseil. Annales de l'Institut Pasteur, 1922, xxxvi., No. 8.

Small-pox in London.

DR. W. H. HAMER, the medical officer of the County of London, has submitted to the Public Health Committee of the Council a statement summarising the information with regard to recent outbreaks of small-pox in and around London. During the period July 26th to Oct. 13th, 1922, 19 cases of small-pox occurred in and around London, including one case which was not discovered until the patient had completely recovered and was therefore not included in the list of notified cases. This series of cases is classified into two main groups with the addition of one isolated case, as follows:—

(*a*) This outbreak originated in Stepney in the person of a youth, aged 16, who developed a rash, which was diagnosed as chicken-pox, on July 4th, 1922. After remaining in bed for four days he assisted his mother in a shop on the premises, serving refreshments and tobacco. He infected six persons with small-pox, four of whom lived in Stepney, including one

who developed his illness in Southend-on-Sea, and two in West Ham; one of the latter worked in the infected area whilst the other traversed the neighbourhood daily on her way to work. Four additional cases occurred among the contacts of the six patients infected by the original case and with these the outbreak terminated, the last case having occurred on August 12th. Of the 11 cases comprising this outbreak, two died, and two others developed a severe type of illness; the remainder suffered from more or less mild attacks. Two of the patients had never been vaccinated and of these one died; in seven cases, whose ages ranged from 16 to 38 years, there was no record of vaccination since infancy and one of these also proved fatal; the remaining two had been vaccinated since infancy and their illness was of a mild character.

(*b*) This group of cases appears to have originated in Dartford, where three persons were removed to hospitals from the same address on Sept. 25th suffering from small-pox. Two of these patients had nearly recovered from a mild attack and were only discovered when a doctor was consulted in regard to the third patient, a woman, aged 49 years, who died a few days later in hospital. A married sister living in London and her child, a girl aged 12 years, visited this woman at Dartford on Sept. 23rd, after the rash had appeared. They returned to London the following day, and were vaccinated on Sept 27th, but too late to ward off the disease. They fell ill about Oct. 3rd and were removed to hospital from an address in Fulham on Oct. 5th. The child's attack is modified by vaccination, but the mother has since died. Two further cases, one in Dartford and one in Bexley, have since occurred among the contacts.

(*c*) An isolated fatal case of small-pox in Bethnal Green was notified, and removed to hospital on Sept. 12th. The source of infection was not traced.

Thus unrecognised cases were responsible for both groups of cases (*a*) and (*b*), emphasising the need for prompt recognition of the disease in the earliest possible stage. In this connexion it is appropriate to mention that the Council places at the disposal of medical officers of health and medical practitioners in London the services of an expert small-pox consultant who is available at all times to give assistance in diagnosis.

The Report of the Public Health Committee points out that the fatality-rate of small-pox in London during these outbreaks, in which 5 out of 19 patients died, presents a striking contrast to that in the rest of the country, where over 700 cases have occurred, mainly in the Midlands and the North, during the present year, of which only one has proved fatal according to the information at present available. This marked variation in the degree of mortality may be ascribed to divergent types of small-pox, the north country type having remained up to the present consistently mild. The danger of an epidemic of virulent small-pox in this country is, in the opinion of the Committee, accentuated by the unvaccinated condition of a large proportion of the population, especially young persons. The report says: "Since the passing of the Vaccination Act, 1898, which provided for exemption from compulsory vaccination of an infant on the production of a certificate of conscientious objection by the parent, the number of infants vaccinated throughout England and Wales has declined from 66·4 per cent. of births in 1899 to 39·5 per cent. in 1920. We are informed that in pre-vaccination days the incidence of fatality of small-pox fell chiefly upon young children, and in our view the accumulation within recent years of large numbers of young persons, deprived of the protection afforded by vaccination in infancy, might be fraught with grave consequences in the event of small-pox becoming prevalent."

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A short course of seven lecture-demonstrations on Gastro-Intestinal Affections in Children will be given at the Children's Clinic, Western General Dispensary, Cosway-street, London, W., on Mondays and Thursdays, at 4.45 P.M., from Nov. 2nd to 23rd inclusive. The first lecture, with experimental illustrations, will be given by Prof. Sir William Bayliss, followed by six practical demonstrations by Dr. Bernard Myers. The fee for the course is one guinea, tickets for which and copies of the complete syllabus can be obtained from the Secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

Annotations.

"Ne quid nimis."

THE TEACHING OF PSYCHO-THERAPY.

"There are many conditions in which the cure must come mainly from within, our function in chief being to call out this dormant power."

IN his presidential address to the Medical Society of London, printed in full at the front of this issue, Lord Dawson quotes with appreciation this saying of the late Sir James Goodhart in regard to the treatment of what he called "common neurosis." The power to penetrate the patient's mind, Lord Dawson went on to say, is part of diagnosis. Alongside the physical culture and training now established as valuable assets to curative and preventive treatment, we need to give a corresponding place to psychical training. Medicine, if it is to fulfil its work, must take mind phenomena more closely into its study and keeping. And yet the newer psychology is regarded with doubt, if not with aversion, by the bulk of the medical profession and at a recent full debate on psycho-therapy no hospital physicians took part. Lord Dawson concluded with a warning, the most impressive of many recently uttered, that unless psycho-pathology is given its place as a serious rubric within the realm of medicine, persons without scientific training or medical knowledge will apply it with scandal to themselves and danger to their victims. Only within the fold will psycho-therapy regain the perspective and restraint which in its present position of isolation it has lost. At the debate to which we have referred, which took place at Glasgow in July, a resolution was passed to the effect that instruction in psychology and psycho-pathology should form part of the curriculum of all medical students, and it may be noted with interest that at the London Hospital, no doubt in part owing to Lord Dawson's influence, lectures on psycho-therapy have been delivered to students over a number of years. At St. Thomas's Hospital the alienist who has charge of instruction in mental diseases is sympathetic towards the newer psychology. Opportunities for such study were until lately so deficient that in the middle of the war it was found necessary to institute at Maghull a special course for training qualified men in the diagnosis and treatment of the psycho-neuroses. If dangers and abuses exist they can only be lessened by recognising the position of the psycho-therapist and giving him academic standing. At present no hard-and-fast line can be drawn in this region of practice between the functions of the doctor and of the priest. At the recent Church Congress in Sheffield, Dr. Arthur Chandler, lately Bishop of Bloemfontein, considered cases of functional nervous disorder in relation to sacramental methods of healing. Psycho-therapeutics might, he suggested, suffice in cases of sudden emotional shock where the conflict between instinct and ethical code had driven the instinctive reaction immediately underground, when mere reassociation or breaking into consciousness of the repressed complex might be all that was required to re-establish the normal. In the more usual cases, Dr. Chandler contended with some justice that the whole nature of the man needed to be strengthened and built up—a lengthier task to be undertaken in common by the two professions, probably with economy of time and effort to both. The various methods of psycho-therapy are being practised, consciously and unconsciously, by all practitioners, although some would admit no need for instruction or information on their subdivision into persuasion, suggestion, re-education, analysis, and so forth. But the public having become keenly interested in this subject, the practitioner must take cognisance of modern methods of psycho-therapy, if only to strengthen his arguments against their abuse. But whatever the medium of treatment the diagnosis of the psycho-neuroses is purely a medical task. The mental processes underlying our actions, now to be

regarded as established facts, are as yet practically a closed book to the practitioner and to the medical student. The position is one which cannot continue.

THE LOW TEMPERATURE RESEARCH STATION AT CAMBRIDGE.

THE Food Investigation Board, in presenting their report for 1921 to the Committee of the Privy Council for Scientific and Industrial Research, include in the introduction to the report a short description of the newly-built low temperature station for research in biochemistry and biophysics at Cambridge. The station is a roughly cubical building of three storeys, of which two floors are divided into insulated chambers, with laboratory accommodation on one side. The ground floor contains 11 chambers, each separately supplied with brine to allow the maintenance of different temperatures in every chamber; the refrigerating arrangements on this floor are planned to give temperatures between freezing-point and −10° F. The first floor, planned chiefly for work on fruit and vegetables, contains eight chambers, some intended for work above freezing-point, others for work at or below it. Electric thermostats have been installed in some of these chambers, and the expected range on this floor will be 28–80° F. On both floors the air-supply is so arranged that no exhaust from any chamber goes to any other chamber; thus there is no risk of contamination of material in one chamber by vapour from another. The top floor is not insulated as a whole, being reserved for future extensions, but in one part of it insulated tanks have been put down for freezing by direct immersion in brine; a small chamber will also be erected on this floor for prolonged tests of insulating materials under cold storage conditions—tests complementary to those carried out by the Engineering Committee of the National Physical Laboratory at Teddington. A striking additional feature of the station is a small greenhouse on the roof, designed for the study of the effect of low temperature upon plants exposed to full solar radiation—having insulated walls and floors and a roof of plain glass and being fitted with refrigerating pipes. A bed of earth has also been laid on the roof, traversed by refrigerating pipes to admit of cooling of the roots of plants otherwise subjected to ordinary air temperatures. These additions, it is hoped, will be of value in the analysis of factors controlling the rate of growth of crops. The engineering side of the equipment of the station proved a very complex problem; the temperature obtainable in each chamber was required to be not only of wide range, but also independent of that of any other chamber. Carbonic acid gas, it may be noted, was chosen as the cooling substance in preference to ammonia on account of the probable toxic action of small quantities of ammonia on fruit or other living substances.

DIAGNOSTIC AND THERAPEUTIC ERRORS IN OPHTHALMOLOGY.

A SYSTEMATIC work on diagnostic and therapeutic errors and their avoidance is being published in Germany in separate volumes. One[1] of these, the second in the series having to do with ophthalmology, is intended as a guide to the general practitioner. For a practical guide it appears in some respects too full and in others too meagre. Two or three times every year, says the author, cases of chronic glaucoma come to his clinic which have been diagnosed by the general practitioner as ordinary senile cataract. To the man who could make such a mistake it is surely useless to talk about measuring the tension of the eye with a tonometer, or examining the fundus to determine whether or not there is cupping of the disc. It is positively dangerous to instruct such a man to measure the field roughly by his hand because early glaucoma can only be diagnosed by exact methods in the hands of an expert, while to leave the diagnosis until it is so unmistakable that a tyro can make it may often mean to make an avoidable blindness inevitable. One of the most essential things for a general practitioner to know is the way to distinguish an acute glaucoma from an acute iritis, and the dangers of a wrong diagnosis. He will find the main points stated, but again we think it is a mistake that he should be advised to employ the tonometer. It is certainly much easier to gauge the tension in any marked case by the fingers than by an intrument which, in hands unaccustomed to its use, may very likely prove fallacious. There are parts of ophthalmology which every general practitioner ought to know, but when it comes to niceties of diagnosis he will do well, unless circumstances have given him special aptitude, to call in some recognised authority.

[1] Erkrankungen der Iris, der Linse und des Glaskörpers. By Prof. Dr. U. Stock, Director of the Eye Clinic in the University of Tübingen. Leipzig: Georg Thieme. 1922. Pp. 32. 1s.

INTRACARDIAC SURGERY.

ONE by one the less accessible portions of the human body are becoming amenable to surgical interference, but up to the present time very little has been done within the chambers of the heart. Bullets have been removed from various situations in the heart, but no attempt has been made to bring the treatment of mitral stenosis into line with that of strictures in other parts of the body. Recent experiments carried out upon dogs by D. S. Allen and E. A. Graham[1] at Washington University have now indicated the lines upon which this problem may be attacked. These observers have applied to the heart the principle of an operating cardioscope, the auriculo-ventricular valve being approached through the wall of the auricle. It was found that making an incision in most parts of the heart wall, whether auricle or ventricle, for passage of the instrument usually resulted in serious hæmorrhage or interference with the heart's action, and that the necessary suturing was also unsatisfactory. They have accordingly introduced their cardioscope through the tip of the auricular appendage. This is usually long enough on the left side to be occluded while the instrument is introduced through an incision, and leakage of blood during the operation is prevented by a simple ligature round the instrument and appendage. The same ligature is tied after the removal of the instrument and it seems that the end of the appendage can be sacrificed without detriment to the heart's action. In this way the use of sutures in the heart wall is avoided. When the cardioscope has entered the auricle it is pushed on until a lens at its extremity is actually in contact with the valves that are the object of attack. Direct vision is thus obtained in spite of the opacity of the blood. A special knife introduced alongside the cardioscope is then brought into play, and the valves may be slit with accuracy. The instrument is then withdrawn and the auricular appendage ligatured as already described. Post-operative mortality following this procedure has been high, but the cause of death has usually been empyema, presumably owing to some failure in asepsis. Several animals have, however, survived the operation of slitting the mitral valves, and all these have developed a loud systolic murmur as evidence that the objective had been reached. Developments in the surgery of the heart on these lines are to be expected.

AGGLUTINATION AND COLLOID CHEMISTRY.

THE paper by Dr. Takuji Shionoya, which we publish in our present issue, is a useful illustration of the ever-widening influence of colloid chemistry on biological investigation. The author starts from the well-known facts first, that an agglutinin-bacteria adsorption complex is obtainable, and secondly, that the presence of salts is necessary for the agglutination of this complex. By the use of solutions of the salts of various cations he shows that the

[1] Jour. Amer. Med. Assoc., vol. lxxix., p. 1028, Sept. 23rd, 1922.

laws of agglutination of the agglutinin-bacteria complex are identical with those of negatively charged colloids—that is to say, the greater the valency of the cation the greater is its precipitating power. (This law of precipitation of a colloid by the ion carrying the opposite electric charge was first indicated by W. B. Hardy in this country, though the author does not refer to this.) The author's experiments on the complex cobalt caticns show this fact very clearly. As the cation valency increases from 1 to 2, 3, 4, and 6, the precipitating powers are represented by the figures 150, 2000, 10,000, 30,000, and 100,000. With this we may compare such data as those of Svedberg of 1 : 20 : 1000 for the precipitation of colloidal arsenious sulphide by cations of valencies 1, 2, 3. Usually the hydrogen ion has an activity in precipitating colloids, which is very much greater than that of other monovalent cations, because it is for some reason more readily adsorbed. Dr. Shionoya does not refer specifically to the activity of the hydrogen ion and say whether this general rule also holds good for the negatively charged agglutinin-bacteria complex. Much recent work on the continent has given indications that the agglutination and sedimentation of red corpuscles is also an electrical colloidal phenomenon, and Dr. Shionoya promises a future contribution on this subject. We confidently expect that his findings will confirm those of the continental investigators, and will indicate that two factors are responsible for this as for bacterial agglutination—viz.: (*a*) A factor which is species—or individual—specific, and which is adsorbed by the agglutinable cells; (*b*) a non-specific ionic factor capable of agglutinating the electrically charged agglutinin-cell complex.

CONGENITAL DEFICIENCY OF THE DIAPHRAGM.

Dr. John Stephen Latta,[1] of the Department of Anatomy of Nebraska University, Omaha, who records a personal case, has collected from the literature 127 cases of congenital deficiency of the diaphragm, 110 of which were left-sided and 17 right-sided. No authentic case of complete absence of the diaphragm was found. In practically all the right-sided cases the deficiency was relatively small, admitting only a slight misplacement of the abdominal viscera into the thorax, usually a small portion of the right lobe of the liver. On the other hand, cases with left-sided deficiency showed considerable variation in the size of the defect. Of the 110 cases of this type, in 68 there were large or medium-sized defects, in 14 the defects were quite small, and in 28 the size of the defect was not stated. The diaphragmatic defect is only occasionally accompanied by other developmental defects apart from undeveloped lung, and in nearly every case the external appearance of the child is absolutely normal. In one case there was hypertrophy of the thyroid gland, and in five instances considerable enlargement of the liver was noted. In seven cases left-sided diaphragmatic defect was accompanied by the presence of accessory lungs. Two cases were reported with an associated hemicephalus, and one with hydrocephalus and also intestinal occlusion. The diagnosis of diaphragmatic defect is extremely difficult, the condition being usually not discovered until the autopsy. Considerable help, however, may be obtained by the use of X rays. The prognosis in all cases is bad; 88 of the 112 cases in which the age at death was stated were either stillborn or died within an hour or two of birth. In the remaining 24 the length of survival ranged from three days to 70 years, but only nine reached adult life. In all cases in which death was the direct result of the diaphragmatic defect, cyanosis, extreme dyspnœa, and vomiting were prominent symptoms, but in a few instances, especially those in which death did not occur until adult life, the diaphragmatic insufficiency was not connected with the cause of death. Dr. Latta's case was that of a male child born with an uneventful delivery and apparently normal except that the heart beat was felt well to the right side of the thorax. Attempts to start respiration failed, although artificial respiration was continued for some time. The autopsy showed that the diaphragm was entirely absent on the left side. In addition to the left lung, which was represented by a small flap of tissue in the upper central portion of the left pleural cavity, and the thymus and heart, which were pressed towards the right, the left pleural cavity, which was greatly increased in size, contained the fundus of the stomach, the duodenum, jejunum, and left lobe of the liver. A triangular mass of tissue slightly larger than the vestigial left lung was found adherent to the free edge of the diaphragm, and proved on histological examination to be an accessory lung.

[1] American Journal of Diseases of Children, October, 1922.

THE PASTEURISATION OF MILK.

THE question of pasteurisation appeared to excite more interest among the delegates who attended the National Milk Conference at the Guildhall last week than any other question included in the very comprehensive programme provided by the Committee of Organisation; for not only was the whole of a three-hours' session occupied with the reading of papers on this subject and with their discussion, but the debate overflowed into the next session, which was reserved for the consideration of the food value of milk. We report elsewhere the general features of this discussion. Prof. G. Dreyer, after explaining in a well-balanced and temperate paper both the advantages and the disadvantages of heating milk prior to consumption, finally summed up in favour of the sterilisation of dangerous milk as the lesser of two evils. Dr. Charles North, of New York, told by proxy the dramatic story of the abandonment of the raw-milk movement in America. Dr. Eric Pritchard pointed out that what the Conference had to consider was whether the dangers connected with the consumption of raw milk by infants and children were sufficiently serious and widespread to warrant the taking of active, and perhaps troublesome, precautions to prevent or mitigate them. In his opinion, the evidence was overwhelming that the dangers were genuine, and widely disseminated. If this view was well founded, he went on to ask whether the team work of the veterinary surgeon, the doctor, the inspector, the milk producer, and the consumer could ensure for the infant a perfectly safe milk—that is to say, safe without further pasteurisation or sterilisation. If the evidence of America on this count could be relied upon, no guarantee of this kind was possible; consequently, unless we can do better than America, our only alternative appears to be to employ methods to kill the bacteria with which the greater proportion of market milk was infected. From the point of view of practical politics the only measures which can secure this end are one or other of the various forms of sterilisation by heat, and in this connexion it is fairly obvious that if milk is liable to contamination at any stage of its passage from the cow to the child no form of commercial pasteurisation which was carried out in the middle of this perilous journey can be depended on. To be effective, sterilisation must be carried out in such a way and at such a time that the milk will be rendered practically germ-free and incapable of being reinfected prior to its consumption by the child. Is the nutritive value depreciated by heating? Many loose statements have been made with respect to this question; a vast series of human experiments clearly proved that the mortality rate among infants in any particular district fell in direct proportion with the employment of sterilised milk in some form or other. This being so, Dr. Pritchard argued that it was impossible to believe that pasteurisation or sterilisation of milk could be productive of any general impairment of nutrition. It had been claimed that pasteurisation, by destroying the acid-producing bacilli in milk, left this highly favourable nutrient

medium at the mercy of proteolytic and other pathogenic bacteria; if this is so, why should not lactic bacilli be added to milk in measured quantities rather than leave it to chance in what quantities, in what varieties, and in what company vicarious bacteria should be allowed to contaminate the milk? Considerations of taste are sometimes urged as an argument against pasteurisation or the scalding of milk. Tastes, however, in the case of adults are acquired and not innate, and in the case of infants and children should be almost entirely disregarded, for children brought up on scalded milk often appear to dislike raw milk. The general feeling at the Conference of the medical delegates with clinical experience was clearly in favour of the sterilisation of wet milk immediately before consumption on the part of the infant, or in favour of the use of dried milk, with the addition in both cases of fresh fruit juice or other supplementary additions which could compensate for any impairment in the quality of accessory food factors.

THE THIRD MINISTER OF HEALTH.

THE new Minister of Health, Sir Arthur Griffith-Boscawen, is 57 years of age and has had much experience that will be of benefit to him in his office. In the late Government he was Minister of Agriculture and Fisheries, a department of State which in these times of economic pressure has come very closely into relation with problems of national health. He was for long a Parliamentary Charity Commissioner and during his membership of the London County Council he presided over the Committee on the Housing of the Working Classes. As Parliamentary Secretary to the Ministry of Pensions he came closely in touch with the after-care of discharged ex-Service men and was responsible in some part for the experiments in simultaneous training and treatment which were successful in restoring many subnormal men to full working capacity. He is well known as a traveller, especially in America and Japan, and has visited a large number of the self-governing Dominions. His war record was distinguished.

PETER WALLWORK LATHAM.

Prof. Peter Wallwork Latham, Senior Fellow of the Royal College of Physicians of London, attained last Saturday the great age of 90 years. Double-first in class lists, university professor, consulting physician, and keen pathologist, Prof. Latham is one of the outstanding figures among our professional veterans. He was the first provincial physician to serve on the Council of the College of Physicians, and to become Senior Censor of the College, where he delivered the Croonian lectures some 40 years ago and the Harveian Oration in 1888. We feel that we are in accord with the wishes of our readers when we transmit to him, in these words, their congratulations not only upon the length of his years, but upon the strenuous and honourable record to which those years testify.

POLITICS AND PUBLIC HEALTH.

THE first de Lamar lecture of the present academic year was given at the Johns Hopkins University on Oct. 9th by Dr. George E. Vincent, President of the Rockefeller Foundation. Although his title was Politics and Public Health, the lecture was practically restricted to the relation of politics to the health officer. The success of Gorgas in the Canal Zone, said the lecturer, was largely due to his ability to make use of military discipline. In some of the older countries of Europe, perhaps, where aristocratic and bureaucratic traditions still linger, it might be possible for health officers to make use of autocratic methods. But the "frontier life" of pioneer America had made autocratic methods unpopular and had resulted at the same time in a thorough dislike of the "expert." It was therefore essential that health officers should understand how to educate their employers—the people. The insecurity of office in some parts of the States, due to political influence, was touched upon, and on the other hand, health officers were candidly warned against dabbling in politics. In discussing the prospects of a public health career the speaker urged that higher salaries must be given and at the same time higher qualifications must be insisted on. The recent action of the profession in England with regard to the appointment of a medical officer of health for Manchester city was quoted with approval. The speaker also referred to an increase of prestige which had come to public health officers in England with the creation of the Ministry of Health. The following personal qualities were considered essential to the health officer's make-up: Imagination, integrity, modesty, enthusiasm, magnanimity, and courage. Magnanimity might be practised both by allowing the civil authority to take credit for the health officer's work and also by giving due credit to the work of junior colleagues. "True leadership consists not in telling other people to do things, but in giving them opportunities." Finally, a word was said on behalf of the politician who, after all, is human and usually believes he is acting for the best. The health officer should know something about men as well as about microbes.

THE LATE MR. GEORGE CADBURY.

THE long life of Mr. George Cadbury, which terminated at Birmingham last Tuesday, was a useful one in many branches of practical medicine. Mr. Cadbury's early ambition was himself to become a doctor but personal ties obliged him to remain in business. When circumstances justified it, his passion for social reform induced him to remove his works altogether from the crowded streets of Birmingham into the country, and the Garden Village of Bournville has developed into an industrial area in which serious public health problems scarcely arise. He himself planned the village, its arrangement of roads and open spaces, its orchards, park, and playing fields, and nearly 20 years ago made over the whole property to a Trust under the Charity Commissioners for the benefit of the nation. He founded a number of medico-social institutions in the neighbourhood of Birmingham, among them the Beeches Children's Convalescent Home and the Woodlands Cripples' Home, and he was one of the original trustees of the Orphan Homes at Leominster. His 83 years were lived with characteristic simplicity and regularity, rising early and living much in the fresh air; and the larger hygiene which he inculcated was an extension of the personal hygiene which he practised himself.

THE Schorstein Memorial Lecture will be delivered by Dr. Percy Kidd on Nov. 8th, at 4 P.M., at the London Hospital Medical College. The subject will be Forty Years in the History of Tuberculosis.

THE next session of the Dental Board of the United Kingdom will commence at 2 P.M. on Tuesday, Nov. 14th, when the chairman, the Rt. Hon. Francis Dyke Acland, M.P., will give an address. The Board will continue to sit from day to day until the termination of its business.

Mr. Arthur Marmaduke Sheild, who died on August 4th, bequeathed the ultimate residue of his property, estimated at about £70,000, to the medical school of the University of Cambridge. A first charge on this magnificent bequest is to be a Marmaduke Sheild Scholarship in human anatomy, and the balance will be devoted for the general purposes of the medical school as the Board of Medical Studies may direct.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW. A meeting was held on Oct. 6th, when Dr. A. Maitland Ramsay, the President, delivered his inaugural address on the Clinical Significance of Failing Sight. The address covered a wide field and was illustrated by clinical references. Dr. Ramsay pleaded for a closer coöperation between the ophthalmic surgeon and the family doctor, and showed that "failing sight" was a symptom observed in many disease conditions occurring in family practice.

THE ANNUAL PANEL CONFERENCE.

THE annual Conference of representatives of local medical and panel committees, which met at the Central Hall, Westminster, on Friday, Oct. 20th, Dr. H. G. DAIN (Birmingham) presiding, had much important business to transact which demanded a long adjournment on the Saturday morning. Special interest centred round the preparations desirable to meet the situation which will arise at the end of 1923, when the capitation fee, temporarily fixed by the Act of 1922, comes up again for consideration along with the administration of medical benefit.

Medical Benefit and Approved Society Control.

In certain aspects the situation is clearer than at the time of the Special Conference[1] held on May 18th, when the National Health Insurance Bill was still before Parliament. Efforts were made during the committee stage of the Bill by representatives of approved societies to secure official status in arranging the terms of medical service and remuneration. An ambiguous proviso—"subject to such conditions as may be prescribed"—then gave cause for anxiety. The Minister of Health, however, stated in the House of Commons on May 24th that there was not a word in the Bill which modified the existing statutory provision for the control of medical benefit and the parenthetical words were intended solely to provide for detailed conditions which might arise in the field of administration. They would not be used in any way inconsistent with the general principle laid down.

In the second place, since the Spring Conference, the annual representative meeting of the B.M.A. had endorsed the position taken up by the insurance medical service in the two following resolutions:—

Resolved: That the measure of success which has attended the experiment of providing medical benefit under the National Health Insurance Acts system has been sufficient to justify the profession in uniting to ensure the continuance and improvement of an insurance system.

Resolved: That the Representative Body insists upon the continuance of the system of negotiating the actual terms of the contract of service which has prevailed since the coming into force of the National Health Insurance system—i.e., direct negotiations between the Government and the profession without the intervention of any third party; but will continue to welcome the coöperation of all those interested in the development of the best possible medical service for insured persons.

Outline of a Policy.

At the Spring Conference the chairman of the Insurance Acts Committee (I.A.C.) gave an undertaking to submit to the annual Conference the general lines of the policy which it would suggest should be followed by insurance practitioners should circumstances arise making it necessary for them to give notice to terminate their contract under the National Health Insurance system. The situation as set out by the I.A.C. is substantially as follows. The present arrangement with the medical profession to give medical advice and treatment to insured persons for remuneration based on a capitation fee of 9*s.* 6*d.* per insured person comes to an end on Dec. 31st, 1923. Some new arrangement will then be necessary. The Government, acting on the recommendation of the Geddes Committee, embodied with certain modifications in the Act of 1922, will have under the National Health Insurance Acts 7*s.* per insured person to offer to the profession, additional money being forthcoming from one of three sources:—(1) An additional contribution from insured persons and employers; (2) a further draft from some of the reserve funds of the approved societies; (3) a fresh grant of money from the Treasury; (4) or some redistribution of insurance funds.

The insured person who is at work is at present having as much deducted from his wages for insurance (health and unemployment), trade union subscription, and the like, as he believes is fair, and he would therefore be against any increase in his contribution. Employers may be expected to be averse from contributing more, while it must not be forgotten that the existing actuarial figure was to be for a limited period. The approved societies would be loth to agree to further drafts on their resources unless they received some measure of definite control over medical benefit, and at this point the medical profession will have to be ready with arguments of public appeal. The Government still has the right, secured by legislation in 1913, to contribute towards the cost of any benefits conferred by the Act of 1911 "out of moneys provided by Parliament." This implies a direct vote of Parliament, which would be attended with difficulty. A diminution in the cost of administration is a hopeful channel to explore.

Prospects at the End of 1923.

For the guidance of the Conference the I.A.C. considered the situation which would arise supposing that the Government declined to ask Parliament for a sufficient grant and offered a final figure which insurance practitioners felt unable to accept. The alternative prospects would then be as follows:—

1. The Government might, by new legislation, abolish medical benefit altogether.

2. The Government might, without legislation, suspend medical benefit, and either (*a*) make no arrangements for medical benefit, reducing the contribution from insured persons accordingly; (*b*) give the insured persons the 7*s.* to pay for their own medical attendance; (*c*) hand the 7*s.* over to the approved societies and let them try to organise a service; or (*d*) try to organise a Government medical service in coöperation with the insurance committees.

The question of the organisation of insurance practitioners in readiness for eventualities had engaged the attention of the I.A.C., and a memorandum on the whole question had been submitted to panel committees with a view to consideration at the Conference. In view of the vital importance of the subject the I.A.C. proposed that discussion should be of a general nature and that no final decision should be arrived at until the report of this discussion had been placed before insurance practitioners throughout the country, a further Conference to be called in the spring of 1923 to discuss any definite action.

Organisation of Insurance Practitioners.

Abolition of medical benefit was not considered a likely line to be taken by the Government; it would be strongly opposed by the great majority of insured persons and by that growing section of public opinion which had a care for national health. Should, however, this action be taken it would be the occasion to put into general force the scheme of public medical service which had been a proved success at Leicester and some other places. Discussion chiefly turned on the action appropriate to meet a temporary suspension of medical benefit. Refusal by insurance practitioners of any and every form of contract practice, while obviously providing the best fighting weapon (if this was the thing desired), would mean in many areas, especially colliery districts, a break with the system of medical practice in vogue long before the Insurance Acts started, and the only system understood by the workers themselves. It would be a legitimate alternative for practitioners to enter into an individual contract with insured persons, provided that the fees charged were not below a certain minimum to be fixed centrally, and provided that neither directly nor indirectly were approved societies in any way recognised. Discussion of the varying conditions in different areas was full and frank, no resolution of any kind being put to the Conference.

Scheme for Collective Bargaining.

A scheme for collective bargaining as regards agreements between insurance practitioners and insurance committees, approved by the annual Conference of 1917, was submitted to the Conference for approval. It was agreed that in the light of the experience and increased confidence of the last five years a smaller percentage of resignations would be

[1] THE LANCET, May 27th, p. 1059.

effective. Personnel must weigh and the Ministry would hardly care to carry on the service with the holders of large panels only; 66 per cent. of small panel resignations would suffice. It was left in the discretion of the I.A.C., on consideration of all the circumstances, whether or no to instruct the sending in of resignations in an area where the percentage was less than 66, provided that the practitioners in that area were afforded the opportunity of reconsidering their position before the instruction was given.

National Insurance Defence Trust.

A report presented by the trustees for 1921–22 showed a balance on August 31st last of £31,300. Dr. A. Cox, the secretary, added that the balance was to date over £34,500. He considered the present position of the fund to be highly encouraging. The report showed that 63 per cent. of panel committees had subscribed and another 14 per cent. (28 committees) promised their support. In the last few weeks many of these 28 had redeemed their promise, but the total amount received, so far some £6000 a year, was still only about one-quarter of the agreed basis of ½d. per insured person. A motion by Devonshire was largely carried that at the present serious moment in the fortunes of insurance practice every panel committee ought at once to contribute fully to the Trust. Prolonged applause greeted a suggestion that London, being the area in which so many troubles had their origin, should reconsider its refusal to contribute until joint action with the Medical Practitioners' Union (M.P.U.) is assured.

Additional Benefits.

Attention was called in the report of the I.A.C. that ophthalmic benefit was being granted through a body known as the National Insurance Beneficent Society by a number of approved societies, the benefit consisting in sight-testing and supply of spectacles out of surplus moneys. The I.A.C., having suggested that any society using its surplus funds for medical benefits and treatment would be acting against Section 14 of the 1911 Act, the Ministry replied that the additional benefit referred to was a monetary payment for the part or the whole of the cost of the treatment obtained by members themselves and not the organisation of services for them. Dental and nursing services were admittedly outside statutory medical benefit, but the I.A.C. regarded it essential to bring specialist services under the jurisdiction of insurance committees. The Conference resolved with almost complete unanimity that, while desirous of making the medical service as full and complete as possible, they were opposed to any system of extension which would make the amount available for the remuneration of general practitioner services dependent on the amount of previous deductions from the pool for such specialist services as major operations and laboratory work.

Coöperation with the Medical Practitioners' Union.

At the last annual Conference it was left to the executive to use its discretion in endeavouring to obtain united action in matters concerning insurance practice. A number of discussions have been held between representatives of the I.A.C. and of the M.P.U., but the I.A.C. stated that the matter was not yet ripe for report. A motion by London was taken to the effect that no effort should be spared to secure the unity of the profession working under the N.H. Acts, and the I.A.C. hoped to be able before Christmas to report agreement on a scheme for combined action.

Transfer of Practices.

The chairman of the I.A.C. indicated that the Ministry of Health had accepted in substance the proposals made by it in regard to transfer. On the initiative of any panel committee a paragraph will be inserted in the local distribution scheme arranging, on the death or retirement of an insurance practitioner, for the whole of his credits (not the individual patients) to be transferred to his successor for a period of 18 months. The list would be adjusted in the interval from quarter to quarter, with a final allocation by the committee at the end of the period. In this way, without admitting any "vested interest in insured persons," the market value of an insurance practice was made to correspond to the usual "18 months' purchase" in private practice. A new model clause to this effect was to be circulated. On this assurance various motions in regard to freedom of transfer were withdrawn.

Canvassing on Transfer.

On a motion by Durham to the effect—

That, under new regulations for transfer of patients, steps should be taken to prevent canvassing for transfers either through or on behalf of any practitioner or society,

it was pointed out that while free choice of doctor was apparently secured by the patient himself and his doctor being required to sign the transfer form, yet pressure was put on patients by certain approved societies to transfer to doctors preferred for some reason by the society. The Durham miner had no will of his own and did just what his officials told him to do. In large factories there was a tendency for cards to be collected in bulk and handed over to the works doctor. Patients had to apply for their cards to the secretary of a friendly society, who was apt to exert personal influence. Unfortunately, in cases of canvassing it was at present only the doctor who could be penalised. It was suggested that possession of a transfer card not his own by anyone might be made a punishable offence. The motion was carried unanimously.

Pension and Superannuation Schemes.

Conferences between the London Panel Committee, the Medical Sickness, Annuity and Life Assurance Society, and the I.A.C. had taken place; motions by London to negotiate the inclusion of a pension scheme in any new arrangement with the Ministry of terms of service, and by Walsall to formulate a compulsory superannuation scheme were withdrawn on the assurance that a subcommittee of the I.A.C. was going into the matter, using the London and other information. Prima facie a satisfactory scheme appeared practicable.

A Number of Isolated Resolutions.

Without much discussion resolutions to the following effect were accepted by the Conference:—

Resolved: to endeavour to ensure three months' notice to local medical and panel committees for consideration of any proposed future alteration in the terms of service.

Resolved: to draw attention to the considerable number of insured persons receiving medical benefit subsequent to their suspension and to devise steps to obviate this.

Resolved: to bring the organisation of insurance practitioners, in the event of a refusal of the terms offered by the Government for N.H. insurance work, before senior medical students who are likely to qualify next year.

Resolved: to urge upon the Ministry the desirability of simplifying the certification system, so that one book should suffice for all purposes.

Resolved: to amend Rule 11 so that, in the case of an insured person entering a convalescent home, the intermediate convalescent certificate should cover the whole period spent in the institution.

Dinner to the Insurance Acts Committee.

The usual dinner given by members of the Conference to the Insurance Acts Committee was held at the Holborn Restaurant on the Friday evening, when over a hundred delegates sat down. The chair was taken by Dr. H. J. Cardale, chairman of the London Panel Committee, and the guests included Dr. H. B. Brackenbury, Dr. H. G. Dain, Dr. E. A. Gregg, Dr. F. Radcliffe, Dr. T. Ridley Bailey, Dr. J. P. Williams-Freeman, with Dr. A. Cox, Dr. J. R. Drever, and Dr. G. C. Anderson of the B.M.A. medical staff. The Chairman read apologies for absence from Sir William Macewen, Sir William Hodgson, Prof. R. A. Bolam, and Dr. P. V. Fry. Dr. Peter Macdonald (York), in a happy speech, proposed the principal toast, that of "The Insurance Acts Committee." He laid stress on the need for a real living organisation, the value of which was illustrated by the history of the negotiations between the medical profession and

the Ministry of Health from 1912 to 1922. The Insurance Acts Committee had achieved much which could be counted of material advantage to the medical profession, and the labours of its members commanded as their reward the loyal support of every insurance practitioner in the land. They had done much, both in times of crisis and in the quieter intervals, to bring the right pressure to bear on those who had the development of the insurance service in their hands. He coupled with the toast the names of Dr. Brackenbury, Dr. Cox, Dr. Dain, and Dr. Williams-Freeman. In replying, Dr. Brackenbury said that in a strenuous life there was no part of his work that he enjoyed more, or obtained more satisfaction from, than his work on the Insurance Acts Committee. He wanted no better reward than the loyalty and kindness he received from colleagues. They were all men of experience, devoted to their profession, and could be implicitly trusted by their constituents. Dr. Dain, as chairman of the Conference, thanked the company for the way they had supported the chair during the afternoon. It had been said that the personnel of the Central Committee and of the Conference itself was much the same year by year. Descended, as they were, from ancestors popularly known as "leeches," they could not be expected to shed such a prominent characteristic. Still they always welcomed new blood, and the local committees should always be on the look-out for young men who showed a turn for political work. It was unfortunate that the practitioners who took a prominent part in medical politics were those who had been in practice for years, and only gained position and time to devote to this work when their youthful energy had somewhat waned. There was a great joy in getting away from practice for a time and meeting men from other areas with other ideas. This was a sufficient reward for the time and labour given on that committee. He pointed out that the practitioner who preferred to plough a lonely furrow was an anachronism. Doctors must act in concert. There was never a greater need for medical organisation than at the present time. Dr. Williams-Freeman spoke for the rural practitioners. Dr. Cox expressed his sense of the privilege of working for men who worked for their fellows. The labours of the Insurance Acts Committee were inspired by love of their profession, and he feared that the best friends of the medical profession were not appreciated as such. Dr. D. F. Todd (Sunderland) proposed the health of the chairman, which was drunk with great enthusiasm. An enjoyable evening closed with the singing of "Auld Lang Syne."

UNIVERSITY OF BRISTOL POST-GRADUATE WORK.—The post-graduate courses arranged by the University of Bristol for medical men in various towns of the West of England continue to prove successful. Autumn courses have been arranged at Hereford, Barnstaple, and Bournemouth, two of these being in centres where a first course has already been held. Another form of post-graduate work that has been successful has been the establishment of clinical assistantships at the General Hospital. All these posts have so far been continuously filled. Similar posts are also available at the Royal Infirmary, where work of this kind has been provided for during a number of years.

KING'S COLLEGE HOSPITAL.—*Listerian Society.*—The programme for the session has just been issued. On Oct. 18th Dr. Greville MacDonald gave an inaugural address on the Principles Involved in Specialism. On Nov. 1st Dr. R. Knox will speak on Treatment by X Rays and Radium, and on the 15th Dr. S. A. K. Wilson on the Treatment of Functional Nervous Disease. On the 29th Dr. L. Dulake will discuss the Function of the Gall-bladder; on Jan. 17th, 1923, Dr. T. Wilson Parry will speak on Trephination of the Living Human Skull in Prehistoric Times; on the 31st Dr. Clayton and the massage staff of the hospital will give a demonstration of treatment with remedial exercises. On Feb. 14th there will be a medico-legal mock trial, of which details will be announced later. On the 28th Miss C. D. Williams will give an address on the Life of Pasteur, and Mr. H. K. N. Elphick one on Tissue Culture. Dec. 13th, 1922, and March 14th, 1923, will be clinical evenings. The ordinary meetings will be held at 8.15 P.M., and the clinical evenings and the mock trial at 8 P.M.

THE NATIONAL MILK CONFERENCE.

Sir ALFRED MOND, in opening the morning session on Oct. 17th,[1] pointed out that apart from the health question, bovine tuberculosis caused a great loss to agriculture. He mentioned that the Medical Research Council had appointed a committee for the investigation of the tuberculin tests, with which the Ministry of Health was coöperating.

Dr. A. STANLEY GRIFFITH read a paper on

Bovine Tuberculosis and its Relation to Man.

He said that owing to research work done under the Royal Commission on Tuberculosis and subsequently by its investigators it was now possible to say which type of bacillus was present in 1200 cases of human tuberculosis. This was the largest series of cases which had ever been investigated for the purpose. Of 116 cases of cervical gland tuberculosis, it was found that 87·5 per cent. of those under 5 years were bovine, 61·3 per cent. of those between 5 and 10 years, 37·9 of those between 10 and 16, and 25 per cent. of those 16 years or over. Of 476 cases of bone and joint tuberculosis, 28·7 per cent. of those under 5 years were bovine, 23·1 per cent. of those between 5 and 10, 9·5 per cent. of those between 10 and 16, and 6·4 per cent. of those over 16. Of 126 cases of lupus, 69 per cent. of those under 5 years were bovine, 42·5 per cent. of those between 5 and 10, 60 per cent. of those between 10 and 16, and 17·6 per cent. of those over 16. Of 52 cases of scrofulodermia 58 per cent. of those under 5 were bovine, 44 per cent. of those between 5 and 16, and 7·7 per cent. of those over 16. Of 17 cases of genito-urinary tuberculosis, 3 were found to be bovine in origin. Of 113 post-mortem examinations conducted for the Local Government Board, it was found that in 21·3 per cent. of those under 5 years at death the infecting bacilli were bovine, and in 13·4 per cent. of those where death occurred between 5 and 12 years. From these and similar data it was estimated that bovine tuberculosis caused 6·44 per cent. of all the deaths from tuberculosis in England and Wales, or approximately 3000 deaths every year. Both types of bacillus were equally virulent for man, the mode of entry being an important factor in determining the severity of the disease. Thus the effects of alimentary infection are, as a rule, less severe than those of respiratory infection. The age-incidence and anatomical distribution of the primary lesions clearly point to cow's milk as the source of infection with the bovine type. Cows with tuberculous udders are the most dangerous, but cows with advanced tuberculosis may yield tuberculous milk or infect the milk through infected fæces or uterine discharges.

Capt. S. R. DOUGLAS, F.R.S., read a paper on the

Tuberculin Tests.

The paper described the preparation and standardisation of tuberculin, and its action on tuberculous animals, and also gave the technique of the subcutaneous, ophthalmic, and intra-dermal tests. Captain Douglas then indicated the advantages and disadvantages of the several tests and emphasised the fact that unless the subcutaneous test was carried out with the most scrupulous care, doubtful results would be numerous.

Unfortunately, there was hardly any time left for discussion, and consequently no opportunity of hearing the experience of veterinary surgeons present with regard to the tests.

Lord ELVEDEN presided in the afternoon, when Dr. CHARLES CROWTHER opened with a paper on

Variation in the Composition of Cow's Milk.

He submitted a table showing a day-to-day variation in the mixed morning and evening milk of a herd of 10 cows—of from 3·2 to 3·4 per cent. in fat and of from 8·9 to 9·3 per cent. in non-fatty solids; and another table showing the variation in the morning and evening milk of the same herd. In the latter case the mixed

[1] A report of the opening session on Oct. 16th was given in THE LANCET of Oct. 21st (p. 890).

milk of the 10 cows varied from 2·6 to 3 per cent. for morning fat and from 3·8 to 4·3 for evening fat. The chief natural cause of variation was the individuality of the cow. The fat usually increased slightly after the first month or two of lactation, but the age of the cow had little effect. Of artificial causes of variation, unequal intervals between milkings were the most important, the fat being low after the long interval. Incomplete milking or failure to "strip" was another cause of low fat. Feeding had much less effect than is commonly supposed.

Dr. MONIER WILLIAMS said much more research on the subject was needed.

Mr. MONTGOMERY (New Zealand), referring to Dr. Crowther's statement that, as the price of milk was not regulated by its quality the farmer had no stimulus to produce good milk, mentioned that in New Zealand the milk was sold according to its fat-value; also that milking machines had been perfected, were in general use, and were easy to work and to clean and that any intelligent man could learn to use them in a month.

Dr. JOHN ROBERTSON (M.O.H., Birmingham) read a paper on the Handling and Distribution of Milk, which was abstracted in our last issue.

Pasteurised and Dried Milks.

The third day of the Conference produced animated discussions between the advocates of pasteurised milk and the advocates of clean raw milk. A paper by Dr. CHARLES NORTH (New York) described the campaign for pasteurisation in the United States led by Mr. Nathan Straus since 1892, its wonderful spread, and the coincident drop in infant mortality which is claimed as its result. Both Mr. and Mrs. STRAUS were present and spoke in advocacy of pasteurisation. "Flash" methods of pasteurisation have been entirely replaced in America by the "holding" method, under which the milk is kept at a temperature of 145° F. for 30 minutes. Most of the speakers at the Conference insisted on the need for the pasteurised milk being delivered in bottles. Some of the speakers thought pasteurisation might lead to a perpetuation of dirty methods on the farm, but this has apparently not been the case in America. One danger was pointed out—that pasteurisation kills the lactic acid bacilli and thus stale pasteurised milk may become dangerous without the warning of "curdling." The general opinion appeared to be that adequately pasteurised milk would be a great advance, and the medical speakers were practically unanimous that it was a perfectly satisfactory and safe form of milk. There seemed also to be a strong opinion that Grade A certified milk, owing to its high price, would not be available for the poor.

Dried Milk.

One of the noteworthy features of the papers and discussions was the unanimity of the medical speakers as to the value of dried milk. Prof. G. DREYER in the opening paper thought dried milk the best solution where milk had to be brought long distances. He pointed out that it did away with the difficulty of storage in the home and could be mixed fresh for each feed and expressed the opinion that from the point of view of the developing child it was equal to any milk.—In the afternoon session Dr. ROBERT HUTCHISON spoke emphatically in favour of dried milk and attributed a considerable part of the decline in infant mortality to its ever-increasing use.—Dr. LEONARD HILL, F.R.S., also spoke in favour of dried milk, and humorously suggested that perhaps the milk distributors were only parasites and might have to be abolished and the distribution of milk turned over to the grocers.—Sir MALCOLM MORRIS thought the use of dried or pasteurised milk would to a large extent remove the risk of surgical tuberculosis.—Dr. ERIC PRITCHARD was in favour of pasteurisation and the use of dried milk, and asked those who made vague suggestions about possible damage to health from the use of pasteurised milk to produce their evidence.

One of the speakers at the last session said, "We seem to be coming down rather heavily on the side of dried milk," and a delegate from Leicester said he was in a difficulty. They had just had a very successful "clean milk" campaign in Leicester and now he was told dried milk was just as good. When he returned to Leicester the veteran chairman of the health committee would say, "I told you so."

At every session Prof. HENRY ARMSTRONG warned us not to be in a hurry to come to any decisions, because very little was known about many of the subjects under discussion, they having as yet not been scientifically considered. However that may be, there can be no doubt that the Conference has achieved a useful purpose, that a great stimulus has been given to research, and that dairying has marked an advance towards the position in our national agricultural policy claimed for it by Lord Astor in his opening remarks.

VENTILATION EXPERIMENT AT THE NEW LONDON COUNTY HALL.

(BY AN OLD CORRESPONDENT.)

LONDON has now its Hôtel de Ville. This is an event of more than local importance. The construction of a mote house for the meetings of the 145 representatives of the world's largest city, with the administrative buildings necessary to include something like a thousand different offices, is not only a complex problem in itself, it is likely to become an object-lesson to the whole world. Important technical problems have had to be solved, more or less successfully, in such a building. In spite of its fogs, London cannot hide its light under a bushel; indeed, technicians in every country are anxious to learn how the London of the County Council has fared during the fogs in its new abode. Nor will the world be disappointed, for a brave endeavour has been made to free the Council chamber from impure atmosphere. In a building where many members of the Council have to sit together for many hours, the provision of pure air, sufficient warmth, and good light become matters of vital importance. And it is certain that the way this has been provided for will be a subject of much inquiry, exactly as in the early days of sanitary science all countries sent delegates to learn from the construction of the Houses of Parliament just across the water. Much progress has been more recently achieved; what was then done at Westminster served as an example for many of the leading cities of Europe and America, but since has been found capable of much improvement. Again our newest effort will awaken echoes in far-off lands. And it is probable that the system for the warming and ventilating of the new County Hall will give rise to considerable controversy. Fortunately it will be easy to check the theories propounded by experimentation on a large scale. Our elected representatives will have the honour of serving their fellow citizens in a double capacity, first as county councilmen; secondly as living subjects on whom the effects of manufactured weather will be tried in a wholesale and persistent manner.

New Features in Warming and Ventilation.

The warming and ventilation of the chamber where the Council is to sit, and its adjacent committee-rooms, present two new and important features. No natural air will be admitted. All the air supplied will be what those who make this provision themselves call "manufactured air." This startling statement is bound to provoke much controversy. On the other hand, the way the delivery of this air is ensured is likely to meet with universal approval. A new thermostatic control is used which does what no other similar contrivance has ever been able to achieve. To ventilate properly a large building, such as a theatre, supervision must be constantly exercised; it is needful to be ever on the watch. As a usual rule there are many thermometers in various parts of the building; and, according to the reports received concerning these thermometers, the

ventilation inspector opens or closes valves, increases or lessens the velocity of the fans that propel more or less air and heat to the parts of the building affected. Under such circumstances the efficiency of the ventilation depends on the skill and the assiduity of the attendants. Sometimes after vast sums have been spent over a ventilation plant the result is unsatisfactory.

Changes of temperature, occurring according to the weather, or to the number of persons present in such a chamber, render it necessary to open or shut the valves that regulate the supply of heat. As far as this is a question of temperature, which the thermometers can record, it would be an admirable event if thermometers could be made not only to indicate the rise and fall of temperature, but, at the same time, to open or shut the valves; but floats that can be placed on a column of expanding substance, to fall or rise with sufficient strength to set machinery in motion, have not yet been discovered. But for the thermometer now employed another substance and principle is utilised. Two tubes are placed the one inside the other. The inner tube does not expand, but the outer tube does, opening a small valve which liberates compressed air. An air-compressor fills a tank with air at about 15 pounds, and so there is all the strength needed to open or shut valves. In other words, if the expansion of the thermostat cannot itself work the machinery, it has the power to liberate air which has been so compressed that its force of expansion suffices to do the work needed. Therefore it is only necessary to place a thermostat wherever such changes in temperature are likely to occur as to necessitate an alteration in working the warming and ventilating machinery. This alteration will take place automatically, because the thermostat will liberate a sufficient force of compressed air to perform the task. The services of a skilled attendant, ever watching thermometers in different parts of the building, are no longer required. This, by itself, is a great step forward. It removes one of the principal difficulties in the successful working of careful and elaborate systems of ventilation. An apparatus and not an attendant becomes responsible. So far we have not heard that the apparatus has failed.

The other innovation may be more open to criticism. To supply only manufactured air would be foolish if we could obtain pure air, but where does the Londoner get pure air? Not on the Surrey side by Westminster Bridge. Is not all the air of London manufactured air, made by the mixing of what was originally pure air with countless foreign particles, gases, and effluvia, some of them actually injurious, and none of them natural? Therefore, as we must have manufactured air, we had better manufacture what we ourselves need, then we shall control and know what we are breathing. This argument, however, may not meet with general acceptation. In great manufacturing centres, in such places as Manchester, or in the midst of agglomerations of population such as London, it will be approved and welcomed, but the problem of ventilation does not present itself in this guise to many people. The question has been how to get warmth, combined with constant ventilation and correct humidity.

Principles of Ventilation Compared.

When all nations gathered in Paris in 1889 for the Centenary Exhibition and celebrations, many and important scientific congresses were held. The University of Paris seized the opportunity to inaugurate the newly built portion of the Sorbonne, comprising a magnificent amphitheatre seating 3000 people. Here, before a crowded and distinguished audience from all parts of the world, during an ever-memorable meeting, Pasteur and Lister met and embraced. The special correspondents of THE LANCET, one of whom was acting, as on many previous occasions, as a sanitary commissioner, and who now writes these lines, investigated the matter carefully, and their illustrated report appeared in the issue of this journal of Jan. 2nd, 1892. The principle adopted was the exact opposite to that applied at the County Council chamber. The air from the rue St. Jacques, the rue des Écoles, and the little square that separates the Sorbonne and the Musée de Cluny, was delivered into the amphitheatre just as it was pumped in from the street. It was not touched, it was not even warmed. The people sat in the amphitheatre and breathed exactly the same air as if they were sitting in the street, the only difference being that, in the summer, the air was moistened by passing through a spray of water. But it is not warmed, not even in winter. Yet below the great amphitheatre there are powerful heating batteries and a furnace. These are used an hour or so before a meeting is held. In a short time the inside temperature is raised to 160° F. or more. The walls, floor, seats, and all parts of the building absorb the heat. A quarter of an hour before the public is admitted the hot air is cut off, the air-propelling fans clear all the hot air out of the building, and by the time the public enters they find exactly the same air as they had in the street outside. It is only after about two hours, if the weather is cold and the meeting lasts as long, that a little warmed air may be mixed with the street air; till then the warmth absorbed by the walls and furniture suffices for the comfort of the audience.

Elsewhere this principle is not often so rigorously applied. A compromise is effected. A certain quantity of warmed air is mixed with the air brought from the outside; but, in any case, the greater part of the air people must breathe is not allowed to approach any heating battery or furnace. The warming, it is thought, devitalises the air, so as little warmed air is used as possible. To-day, however, this experience, slowly and laboriously acquired, has been set aside. A ventilating plant has been installed at the New County Hall based on the opposite principle—namely, that no air whatsoever shall be supplied which has not first been duly treated. The air from outside, from the street, or even if it comes from the broad surface of the Thames, must be transformed and manufactured anew. It must be filtered, washed, purified, altered. All the solid particles it holds in suspension must be removed, its proportion of humidity regulated, and its degree of heat immutably fixed. The British climate is defied, the varying conditions of our smoke-defiled atmosphere are set at naught. A firm of engineers have decided what our county councilmen shall breathe, and that they shall have that and nothing else.

The "Carrier System."

It is the "Carrier System" installed by the Buffalo Forge Co., Ltd., London, that is responsible for these startling innovations. They have constructed in the basement of the New County Hall what is called a conditioning room. A powerful revolving fan draws in the air-supply, and it first passes through the "humifier chamber." Here a minutely divided spray of water is discharged from a number of nozzles so that it mixes with and completely saturates the air. Then the air passes through eliminator plates which separate and remove the free water from the air. This process not only carries away in the water the particles of dust, soot, and minute foreign bodies suspended in the air, but also helps to regulate the temperature of the air itself. The air passing over the stem of a graduated thermostat produces a change of pressure on a diaphragm steam valve which causes it to partially open or close so as to regulate the temperature by controlling the amount of steam mixed with the spray water. Though sensitive, the system is not delicate, but wears well, and meets all variations of temperature without readjustment. The argument is that after the air has been saturated it does not matter to how high a temperature it is heated, provided it is cooled afterwards to the required final temperature corresponding to the desired relative humidity. Then, also, air cannot be injured by the burning of the particles it contains on the very hot surface of stoves or warming batteries. With the present system, 98 per cent. of such particles,

I am assured, are carried away in the water used for the humidifying.

Manufactured Climates.

Ozone also can easily be introduced with the air. In fact, it is proposed to manufacture any sort of climate needed either for medical or industrial purposes. Air cold, warm, humid, and dry, are all at hand. A valve opened or shut makes the needed difference. We are called upon to believe that the day is near when we need only to telephone and our hospital wards will be supplied with the climate of the Sahara, of the mid-Atlantic, of the Alps, or of a deep pinewood forest. But then, of course, we must say good-bye to our own climate, against which every true Britisher claims the constitutional right to grumble, but from which he may not be quite so ready to part. So far the system has been more often applied to industries such as textile factories; and here, in London, Messrs. J. Lyons and Co., the caterers, provide those who make their delicate chocolates with a special atmosphere. It remains to see how far the County Council climate will approximate to the chocolate climate, or to some other more bracing atmosphere.

Then we have still to deal with the more usual problems, such as the quantity of air supplied, its delivery in sufficient volume but so slowly as not to cause draughts, and yet with sufficient force to reach every part of the building. But this will be best considered when the Council is actually in session; and then we shall also be able to hear what the councillors themselves think of the manufactured air that will be supplied to them.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Vital Statistics of Northern Ireland.

As an interesting by-product of recent political events in Ireland, we may note the receipt of No. 1 of a quarterly return of the marriages, births, and deaths registered in Northern Ireland; the marriages registered being for the last quarter of 1921, and the births and deaths for the first three months of 1922. The return is made under the authority of the Minister of Finance for Northern Ireland, the estimated population of which is 1,284,000, inclusive of military. It comprises 27 superintendent registration areas, including seven principal towns—viz., Belfast (20·4), Ballymena (16·2), Londonderry (16·2), Lisburn (23·3), Newry (25·1), Portadown (26·0), and Lurgan (29·7). The figures in brackets give the annual death-rate during the first quarter of 1922. The details given i this statistical return correspond closely with those furnished in former returns relating to Ireland as a whole. For the future, the vital statistician will need to refer to two Irish reports for complete information respecting vital conditions in Ireland.

Indirectly, there is already evidence of coöperation between the two divisions of Ireland; for one of the tables in this report compares the chief vital statistics of Dublin and Belfast. The estimated population of Belfast is 386,947, that of Dublin being approximately 10,000 greater. The birth-rates in both cities in the first quarter of 1922 were about 27 per 1000, the general death-rate of Belfast being 20·4, and of Dublin 23·0. Infant mortality was also considerably higher in Dublin than in Belfast. In neither city was there a death from typhus fever. The mortality from tuberculosis was high in both, being 2·37 in Belfast and 2·92 in Dublin. Perhaps the most interesting item in its social and political aspect is that in Belfast 145 and in Dublin only 47 deaths from violence were registered.

Royal College of Physicians of Ireland: Election of President.

At the annual election of the Royal College of Physicians of Ireland, held on St. Luke's Day, the Right Hon. Dr. Michael Francis Cox was elected President. He succeeds Prof. Sir James Craig, who has been President for three years. A hearty vote of thanks to Sir James Craig for his industry and ability in governing the College was passed on the motion of Dr. Walter G. Smith. Dr. Cox has been a Fellow of the College since 1892, and has been for many years a physician to St. Vincent's Hospital. The honorary degree of M.D. was conferred on him by the Royal University of Ireland. He was for some years a member of the Privy Council, but feeling himself out of sympathy with the Government he resigned his membership two years ago. He is a man of wide general culture.

Dr. L. Abrahamson, Prof. J. W. Bigger, and Dr. C. Dickson have been elected Fellows of the Royal College of Physicians.

University Representation in the Free State Parliament.

In the draft constitution of the Irish Free State, as put before the Provisional Parliament, it was proposed that the universities in the Free State should be represented not in the Chamber but in the Senate, each university to have the right of returning two representatives. During the debates in the Parliament this proposal was withdrawn, and a clause was inserted empowering the universities to return three members each to the Chamber. This alteration, which strengthens the position of the universities, met with little more than formal opposition, the Labour Party objecting to such a departure from democratic principles as the recognition of university representation appears to entail.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Conference of Psychiatrists at Budapest.

THE national conference of Hungarian psychiatrists held in Budapest at the beginning of October was attended by many physicians from Hungary and the Succession States. Among the interesting proceedings Dr. Eugen Kollarits, of the University of Budapest, lectured on "The Psychological and Biological Character of Our Age." According to him the psychiatrist has to deal not only with individual patients but also with "mass-life" in the direction of reorganisation of general culture, and the setting of historical and political teaching on a biological foundation. Political science, he said, had lagged behind the other sciences for thousands of years, and now our unfortunate globe is governed by orators. Mr. Méray Horváth Kàroly, a celebrated sociologist, then appealed to the alienists of the country to deal thoroughly with the mass-psychosis which has brought our age and continent to such a pass. He expressed the opinion that the salvation of Europe lay in the hands not of the speculative scientist, but of the practical physician. A keen discussion took place on the treatment of progressive paralysis. Cases were quoted by several medical men in which drugs were administered with only temporary or with no effect. In the cases where total cure was reported, Prof. Sarbó stated that these were wrongly diagnosed. Another speaker enumerated a few cases which, he held, proved that by inoculation with the bacteria of some infectious diseases he could cure paralysis; Prof. Sarbó objected to this statement, also contending that progressive paralysis is an incurable disease, and that whatever treatment may be employed, the patient dies within a few years. Prof. Moravisik then stated that the Minister of Public Welfare wished to prevent medical directors of asylums for the insane from combining medical and administrative duties. The present asylum directors are strongly opposing this move and propose to send a deputation to the Minister to urge a reconsideration of his plan.

Proposed English Periodical for the Hungarian Scientific Academy.

On Oct. 5th the Hungarian Scientific Academy discussed the possibility of the plan of issuing a periodical in four languages—Hungarian, German, French, and

English—to inform the Western countries of the work of the Academy. The plan was unanimously adopted, and the new periodical, which will be translated into the languages mentioned by the respective lecturers in those languages at the University, will appear early next year.

The Fight against Rats.

A few days ago a plague case was reported in a neighbouring country which maintains a great traffic with Hungary by means of the Danube. Most of the cargo ships unload at Budapest, and the sanitary committee of the city have decided on a far-reaching campaign against rats. The committee applied for instructions to the Ministry of Public Welfare, which issued orders for the dissemination of information by means of posters in the streets relating to the necessity for removal of all rubbish which could serve as food for rats, and containing instructions as to methods of poisoning the rodents. Dead rats are to be buried deeply in the earth or burned.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

TWO BRITISH SPAS.

Royal Leamington Spa.

THE estimated population for 1921 was 28,500; the birth-rate 19·1; the corrected death-rate 10·83; the infant mortality-rate 64·1; the pulmonary tuberculosis rate 1·15; the other tuberculosis rate 0·42; and the cancer death-rate 1·57. Dr. W. L. Goldie includes in his report two interesting charts. The first indicates the death-rate and birth-rate since 1891, and shows graphically how the death-rate exceeded the birth-rate during the war and also the great jump in the birth-rate in 1920. The second chart shows the reduction of infant mortality-rate from about 150 to about 60. As in many other places, the neo-natal deaths numbered nearly half of the total infant deaths. The Leamington Council retains three beds in the Warneford, Leamington and South Warwickshire General Hospital and Bathing Institution for maternity cases. Eight cases of encephalitis lethargica were notified with three deaths. No association between any of the cases could be traced. The water-supply, from two wells in the New Red Sandstone, is just sufficient for the needs of the town, but leaves no margin for exceptionally dry weather. The recommendation of the Housing Commission that the proposed houses in the scheme be reduced from 529 to 369 has been accepted, but it is realised that the new number is inadequate. During the last two years 97 houses (two built privately) have been erected to meet what is really a very pressing need. Nine complaints of smoke nuisances from furnace chimneys were received, but there were no prosecutions. The hours of bright sunshine were 1632 and the rainfall 20·16 inches.

Royal Tunbridge Wells.

The estimated population for 1921 was 34,270; the birth-rate was 15·0; the crude death-rate 13·2, and the death-rate, corrected for age and sex constitution of the population, 11·5. The infant mortality-rate was 48·7. The rainfall for the year was the lowest on record, 16·45 inches, and the hours of bright sunshine were 1795, which, Dr. F. C. Linton tells us, was the highest amount recorded amongst inland health-resorts keeping records for the Meteorological Office. Dr. Linton cites the facts that of 25 infant deaths 15 occurred in the first week of life and that there were 20 stillbirths as cogent reasons for the establishment of an antenatal clinic. One of the two infant welfare centres is held in utterly unsuitable premises in the basement of the Public Health Office, and Dr. Linton favours a new maternity and child welfare centre and school clinic combined. Of the 32 fatal cases of tuberculosis, no less than 10 were unnotified at the time of death. Dental treatment in the schools has just been begun.

Correspondence.

"Audi alteram partem."

THE LATER EFFECTS OF GAS-POISONING.

To the Editor of THE LANCET.

SIR,—Colonel T. E. Sandall's most interesting and thoughtful article in THE LANCET of Oct. 21st appeals to me as an admirable example of the scrupulous fairness which, whatever may be said to the contrary, actuates all officials more than willing to do justice to the war pensioner; whilst throughout I believe I read the expression of a doubt which was ever present in my own mind during the war, and which I must say is still present, how far any permanent disability whatever results from gas-poisoning.

It must, I think, be conceded that none of the signs and symptoms enumerated by Colonel Sandall as later effects of gas poisoning is at all convincing. If Colonel Sandall can obtain unequivocal evidence, first that an affected pensioner was *totus teres atque rotundus* before the war, and secondly that he was undoubtedly gassed, then it would be unreasonable as well as unfair to refuse to hold his experience as responsible for any of these physical signs and even of symptoms without physical signs. But I venture to believe that Colonel Sandall himself would be far from satisfied upon either, let alone both, of these issues.

Many thousands of men were unquestionably gassed and were subsequently discharged free from any after-effect. I myself saw many hundreds said to have been gassed who had probably never been within a hundred yards of an attack, and if I saw so many the total number certified in this way may well have been enormous. One has to remember that the latent period for the development of severe symptoms was recognised in certain cases of gassing as dangerously insidious, compelling battalion M.O.'s to transfer all such possible cases, which, bearing their original diagnosis, travelled rapidly and continuously until they arrived at military hospitals in this country. I well remember one convoy of 50 "gassed" cases all exhibiting alarming polypnœa—one cannot say dyspnœa—all of whom made an immediate recovery as soon as they were individually reassured and their respiration disciplined. Many of the men frankly admitted that they had been terrified, and, indeed, one can sympathise with the terror resulting from the contemplation they must have had of serious examples. Even the ingestion of a small quantity either by design, experimentally, or by accident during a gas course is a sufficiently alarming experience.

I can whole-heartedly support Colonel Sandall in his opinion that tuberculosis does not follow gas poisoning. One instance in my experience is perhaps worth recording, especially in view of what I have said as to the difficulty in obtaining really reliable evidence. A well-known tuberculosis authority who held very dogmatic and contrary views to mine upon this subject triumphantly produced for my discomfiture a man who had been gassed and who now showed unmistakable infiltration of one lung and tubercle bacilli in his sputum. He may or may not have been gassed, but the interesting feature was that by a remarkable coincidence this particular man had been under my care for 18 months antecedent to the war, during which time the signs in his chest had been present to the same extent and tubercle bacilli had been constantly identified in his sputum.

There are many other interesting points in Colonel Sandall's article, but I should be encroaching unreasonably upon your valuable space did I presume to deal with them at any length. Whatever one's conviction, I cannot see how one can possibly prove that some of the cases of chronic bronchitis and emphysema said to have followed gas poisoning may not owe their pulmonary lesion to an original injury by the gas inhaled. As for the symptoms mentioned, the

tachycardia, shortness of breath on exertion, tightness of the chest, palpitation, giddiness, nervousness, tremors—all of these fall within that category which we all knew only too well during the war and labelled according to our predilections "D.A.H.," "Soldier's heart," "Effort syndrome," "Neuro-circulatory asthenia," or what not, and for the production of which innumerable causes were held responsible. But it would be outside my present purpose to indulge in speculation how far any one of the conditions inseparable from military service might be inculpated and how far they were pre-existing symptoms and merely unmasked during the war.

I am, Sir, yours faithfully,

ADOLPHE ABRAHAMS.

Harley-street, W., Oct. 21st, 1922.

PRIMARY PHLEGMONOUS ENTERITIS.

To the Editor of THE LANCET.

SIR,—May I suggest that the case described by Mr. E. E. Hughes in your issue of Oct. 21st under this title was really one of the so-called Henoch's purpura which is apt to simulate intestinal obstruction due to intussusception, and that the boy would have recovered without operation. The initial symptoms are consonant with such a diagnosis, and the subsequent occurrence of a blotchy rash on the forearms and legs and slight swelling of the knees is more than suggestive. Moreover, the previous history of pains in the elbows and knees and fever, leading to a diagnosis of acute rheumatism, before the onset of the visceral lesion, is of common occurrence in such cases. It is not stated that the rash was purpuric, but examination of the portion of the gut revealed numerous extensive hæmorrhages into the submucosa. As long ago as 1808 Willan described visceral lesions in purpura, including exudation into the wall of the stomach and intestines. It is regrettable that Mr. Hughes has not pointed out the special features, if any, distinguishing his case from Henoch's purpura. Superficial ulcers or extensive necrosis of the mucosa and submucosa may be present and purpuric spots in the skin may be absent. In addition, this type of case occurs in children.

I am, Sir yours faithfully,

EDMUND CAUTLEY.

Park-street, W., Oct. 23rd, 1922.

THE EFFECT OF POSITION IN THE FAMILY ON THE HEALTH OF THE CHILD.

To the Editor of THE LANCET.

SIR,—I should now like to reply to the correspondence following my article in THE LANCET of Oct. 7th on the above subject. Dr. N. Haire is very distressed that while I have investigated the incidence of disease I have omitted to consider the child mortality-rate. He suggests that the latter would have greatly modified my conclusions if not entirely reversed them, and forthwith proceeds in support of this contention to reproduce three tables of figures of which the first is the most definite in describing age, environment, &c. It is the table of infantile mortality-rates in a mining population and is associated with the name of Dr. Ploetz. Of course the whole point, if there is one, of Dr. Haire's criticism rests entirely on the assumption that these infantile mortality-rates are a true index of the health of the child according to position in family, even in the notoriously bad environment of the miner's home. He makes no attempt to justify such an assumption, which, as a matter of fact, is quite contrary to the conclusions of Dr. Ploetz, whose name he attaches to the table. To quote from Dr. Schuster, "Eugenics," p. 202.

"Dr. Ploetz expresses the opinion that excessive mortality among the later born is due largely to the fact that in a poor home where the family has become large the economic conditions grow worse and such children as are born receive less attention and care than when the family was smaller."

Dr. Haire should have, therefore, headed his criticism: "Some Tables Showing Infant Mortality-Rate among Later Born Children under the Conditions of Miners' Homes," which is quite a different proposition. He could then read up the recent extensive literature on the causes of infant mortality, especially in mining towns, and he would find that since Dr. Ploetz's conclusions in 1913 the words "economic conditions" would have to give place to "unhygienic and insanitary conditions." This statement is rather beautifully illustrated in the case of Colchester, where under Dr. W. F. Corfield the infantile mortality-rate for 1920 dropped to the extremely low rate of 44, in striking contrast with the rate for mining towns which is three times as great, although the average economic conditions for all Colchester families are probably not as good as those of miners. Infant mortality-rate is now well recognised as one of the best indices of the hygienic condition of a town and the latter is the real reason for the mortality differences here in this instance. It may also be added that this lowest Colchester infant death-rate happened to coincide with a sharp rise in the birth-rate, which is all very discomforting to Malthusian susceptibilities but is what Dr. Haire has himself asked for.

To return to the original title of these communications: if Dr. Haire is still anxious to reverse the accumulating conclusions whose nature is indicated (for example) by Prof. Karl Pearson's classic "The Handicap of the Firstborn"; by the findings of two independent school medical officers (quoted in Birth Rate C. Report) that the healthiest children were the fifth and sixth respectively; and by the unanimous agreement with conclusions of the same kind which appeared in the London press in comments on my article, then I would suggest that it is desirable for him to first try to accurately establish the connexion between the matter under discussion and the figures which he reproduces in such interesting abundance.

I am, Sir, yours faithfully,

R. H. VERCOE.

Fellows-road, Hampstead, N.W., Oct. 21st, 1922.

THE ACTION OF RADIATION ON CANCER.

To the Editor of THE LANCET.

SIR,—In your leading article on the Culture of Tissues in Vitro you refer to the action of X rays and radium on cancer. I have been interested for many years in this subject and rejoice to read your remark—

"At present the conception of the mode of action of X rays and radium is entirely dominated by the idea that these radiations kill the cancer cell directly, and no importance is attached to the process by which the cancer cells—even those that have been killed—undergo absorption."

In the course of an introduction to a discussion in the Section of Electro-Therapeutics and Radiology at the annual meeting of the British Medical Association at Liverpool in 1912, I set out my experience that the character of the histological changes discovered in malignant tissues after radiation is to some extent uniform. On reviewing the changes observed in large numbers of sections of carcinomata and sarcomata which had been subjected to X rays, I found that they included round-celled inflammatory infiltration formation of fibrous tissue in varying amount and density, and necrosis of tumour cells. All these changes are seen repeatedly in tumours that have not been exposed to the action of X rays or radium, and I interpret them as due to reactive inflammatory processes on the part of the body tissues in their attempt to check and ultimately overcome the cells of the tumour. Malignant tumours undoubtedly diminish in size under the action of X rays and radium, but so they do without this treatment in a small number of cases. Why does the tumour decrease in size? Are the cells destroyed and absorbed, or is it due to the action of the contracting fibrous tissue? I think both these causes are at work. I would summarise the position thus: Nature in her attempts to check and destroy the invading cells of a malignant

growth brings all her inflammatory forces into line. X rays and radium act by destroying a certain number of malignant cells outright, but they act mainly as a stimulant to the healthy cells of the body to urge them on to still greater inflammatory activity.

The best way to investigate the problems is coöperation between the pathologist and radiologist. Both should be men of experience, and both should have a sceptical mind. My experience of most radiologists is that they do not study pathology enough and are too eager to attribute changes found in tumours to the action of rays alone.

I am, Sir, yours faithfully,

ERNEST H. SHAW.

Camden-road, Holloway, N., Oct. 22nd, 1922.

EPIDIDYMITIS IN MALARIA AND DYSENTERY.

To the Editor of THE LANCET.

SIR,—I should feel greatly obliged to any colleague who can refer me to recorded instances of subacute or chronic epididymitis due to malaria or dysentery, or who has met with such cases. Further, if malarial, whether this condition is favourably influenced by quinine.—I am, Sir, yours faithfully,

P. WATSON-WILLIAMS.

Clifton, Bristol, Oct. 23rd, 1922.

DEATH IN THE ALPS.

To the Editor of THE LANCET.

SIR,—Dr. W. J. Rutherfurd[1] shows perturbation at his discovery that the theory of the unconscious explains those phenomena attributed to demoniacal possession. Concerning the theory I once wrote[2]: "If the reader thinks this conception brings us back to the old one of demoniacal possession I will admit that the only difference lies in the definition of the demon;" and the critics said my views were not original. Why is Dr. Rutherfurd so perturbed, instead of being justifiably proud of his acumen? And why make it a reproach that the psychogenetic theory of epilepsy finds support in Holy Writ?

I am, Sir, yours faithfully,

MILIAIS CULPIN.

Queen Anne-street, W., Oct. 21st, 1922.

CHRONIC ENDOCERVICITIS AND ITS TREATMENT.

To the Editor of THE LANCET.

SIR,—I have read with considerable appreciation Dr. J. W. Burns's article on the above subject in THE LANCET of Oct. 14th, and find myself in agreement with most of his conclusions. There are one or two points, however, on which I should like to comment.

First, as to the bacteriology. I am afraid, with the technique described, the chances of discovering the true percentage of cases due to the gonococcus are remote. The gonococcus is notoriously difficult to find in smears from the endocervix, and still more difficult in cultures. The complement-fixation test I have found practically valueless in women. The difficulty, therefore, of saying definitely whether or not a case of chronic endocervicitis is gonococcal, and still contagious, or non-gonococcal, and unlikely to set up a urethritis in the male, is very great.

As a help in diagnosis it will be found that if a gonococcal proteose be injected subcutaneously, and a smear taken 48 hours afterwards, gonococci will often be discovered in smear and culture from cases of this nature which would otherwise have been pronounced due to secondary organisms only. If the proteose is not available, swabbing out the endocervix with 2 per cent. silver nitrate, and taking a smear 24–48 hours afterwards, often gives similar results.

In addition, the composition of the media used is of extreme importance. Even when the gonococcus is known to be present, I have found, time and again, that competent bacteriologists, coming to the London Lock Hospital for material, have been unable with the media at their disposal to grow the organism. I am not surprised, therefore, to find that in Dr. Burns's cases only about 4 per cent. were found to grow the gonococcus.

With regard to treatment, whilst not condemning drugs, caustics, curettage, in the whole-hearted manner of Dr. Burns, I am entirely with him in considering indiscriminate douching actually harmful, and vaccines practically valueless, in this condition. I am particularly pleased, moreover, to find at length some recognition of the pioneer work of the late Dr. Sloan, of Glasgow, the value of whose methods is now only beginning to be appreciated. Ionisation properly carried out is exceedingly valuable in chronic endocervicitis, and anyone stimulated by Dr. Burns's article to use it should read Dr. Sloan's book[1] on the subject.

Dr. Burns's description of the technique is incomplete, probably from reasons of space, and if followed, without further guide, liable to get the practitioner into trouble; for after running the current for some 10 or 15 minutes, as described, it will be found that, on attempting to withdraw the zinc rod from the cervical canal, it is firmly held by the mucous membrane, and often cannot be dislodged without causing bleeding. If, however, the current is reversed for five minutes before withdrawing, the rod comes out quite easily.

On the subject of erosion I am afraid I do not see eye to eye with Dr. Burns; but I feel that I have trespassed too much on your space to dilate upon this question. It only remains for me, therefore, to congratulate both the author and THE LANCET on ventilating this much-neglected subject.

I am, Sir, yours faithfully,

J. JOHNSTON ABRAHAM.

Harley-street, W., Oct. 23rd, 1922.

THE *BACILLUS ABORTUS* AND HUMAN ABORTION.

To the Editor of THE LANCET.

SIR,—On Oct. 16th, at the Milk Conference at the Guildhall, Sir Stewart Stockman, of the Ministry of Agriculture, made the following statement:—

"I have no doubt that thousands of pregnant women have drunk milk containing the *Bacillus abortus*, but in no case has it been alleged that a woman aborted from that cause, at least not so far as I am aware."

His address was on infective abortion in cows. He ascribed the disease to a bacillus which he described, and he stated that if that bacillus were smeared on the pharynx of a pregnant cow it led to abortion. The acoustics of the hall left a good deal to be desired, and I may be mistaken, but if I heard correctly I also understood him to say that the disease could be communicated from cow to cow by ingestion of infected material.

In view of the fact that we cannot in all cases trace the cause of abortion in human beings, it may be worth while to pursue the line of investigation indicated, to study the *Bacillus abortus* from the human point of view, and attempt to determine whether or not there is an ætiological relationship between this micro-organism and abortion in the human female.

I am, Sir, yours faithfully,

S. G. MOORE,
Medical Officer of Health, Huddersfield.

Oct. 18th, 1922.

[1] THE LANCET, Oct. 21st, p. 885.
Spiritualism and the New Psychology, p. 85.

[1] Electrotherapy in Gynæcology, Heinemann.

Obituary.

SIR JAMES GALLOWAY, K.B.E., C.B., M.A., M.D. ABERD., F.R.C.P. LOND., F.R.C.S. ENG., LL.D. ABERD.,

SENIOR PHYSICIAN TO CHARING CROSS HOSPITAL, AND LATE CHIEF COMMISSIONER OF MEDICAL SERVICE UNDER THE MINISTRY OF NATIONAL SERVICE.

IT is with feelings of deep regret, and a sense of loss which will be shared by the medical profession as a whole, that we have to record the death of Sir James Galloway, the senior physician to Charing Cross Hospital, on Wednesday, Oct. 18th, after a short period of acute illness. He had always appeared to enjoy such good health that the news of his unexpected death came upon his many friends as a great shock. But for the past seven years, dating from his period of service as consulting physician with the First and Second Armies in France in 1915–16, he had periodically suffered from symptoms pointing to calculus of the ureter, a condition which, with characteristic consideration, he had kept to himself. A severe attack occurring about three weeks ago seemed to have been happily passed through without operation, when suddenly there supervened an acute local and general infection leading to the fatal termination.

Born in Calcutta on Oct. 10th, 1862, he received his education at the Chanonry School, Aberdeen, and afterwards at the University of Aberdeen, where he graduated M.A. (with honours in Natural Science) in 1883, M.B. in 1886, and finally M.D. (with highest honours) in 1892. His subsequent qualifications included the Fellowship of the Royal College of Surgeons of England in 1889, followed at a later period (1897) by the Fellowship of the Royal College of Physicians of London. Early in his professional career he came to the London Hospital as house physician to Sir Stephen Mackenzie, from whom he got his first interest in the specialty of skin diseases to which he, from that time onwards, devoted himself. His first official hospital appointment in London was that of assistant physician and pathologist to the Great Northern Hospital (1890), followed by that of physician to the skin department, Charing Cross Hospital, in 1894, an office which he continued to hold for 20 years. But from the first his interests were not confined to dermatology; they extended to general medicine, and in 1901 he was appointed assistant physician to Charing Cross Hospital, becoming full physician in 1906, a position which, in due course, would have terminated in the week of his death.

At the medical school he was a zealous and active member of the teaching staff, holding in succession the offices of lecturer in practical medicine, in materia medica and therapeutics, and finally that of lecturer in medicine, while taking an active part throughout on the school committee. For 27 years he thus served the hospital and school at Charing Cross Hospital, and by the soundness of his judgment and the moderation of his counsels he rendered his colleagues and the students the greatest assistance. It is not surprising that his services should have been in request as an examiner, and he held at different times examinerships in medicine at the Society of Apothecaries of London, the Conjoint English Royal Colleges, the Medical Department of the Royal Navy, and finally in the University of London. He was a Member of the Council of the Royal College of Physicians of London, and at his death was Second Censor.

One of the first indications of Galloway's wide professional outlook was his appointment as a member of the Advisory Board of the Army Medical Service formed in 1902, after the conclusion of the Boer War, with the view to reorganise, in the light of the experiences furnished by that war, the scheme of education of officers of the Royal Army Medical Corps. The changes then instituted fundamentally altered the character of the R.A.M.C. and laid the basis of the successful organisation during the future war. It was natural, therefore, that when that war broke out he should be one of the first to be appointed consulting physician to the armies in France—an appointment which he held till recalled to take up the important duties of Chief Commissioner of Medical Services in the Ministry of National Service. It there fell to him to deal with the new and manifold problems connected with recruiting and conscription, the results of which are so well known. For these various war services he fittingly received the recognition of C.B. (Mil.) in 1917, followed by that of K.B.E. in 1918. Subsequent to the war he found scope for his general interest in the profession in the various problems connected with questions of insurance and the relations of the State to the general hospitals. His services were utilised by the Council of the British Medical Association in various capacities as chairman of meetings called to consider these subjects.

The record is evidence of itself that the life of James Galloway was a strenuous one, crowned by much successful achievement and indicating the possession of qualities of the highest order. But to the men who knew him intimately and enjoyed his friendship or who shared his hospital work the qualities which appealed most were those connected with his own personality and character, his dignified presence, his genial, kindly courtesy, the goodness of his heart, his intense human personal interest in everyone with whom he came in contact, whether as colleagues, students, or patients, the soundness of his judgment, his general level-headedness, and the invariably moderating influence of his counsels. It was the possession of these qualities that gave him individuality.

Dr. W. Hunter, a colleague of 25 years' standing, writes:—

The foundations of Galloway's character and outlook on life had been well laid in his original school and university. He early acquired, and throughout life retained, the keenest interest in Natural Sciences—in botany, zoology, geology; above all in subjects relating to old architecture and antiquarian history. As a student he also was keenly interested in music and was himself at one time an accomplished pianist. An incident of his work in this connexion early noted and commented on at the time—and now recalled by one of his oldest friends—gave the key to his whole character in life—namely, a strong desire to bring out their best by subordinating his own play to their needs and limitations. This remained a feature of his work throughout life—in all its many relations—a desire to find the best solution of any problems or difficulties that had to be faced, and to give the utmost help in his power. It was this feature that made him so agreeable a colleague. In all respects an ideal officer, he was most assiduous in his duties, keen, self-sacrificing, with a high sense of responsibility, and with a great feeling of loyalty to the institutions which he served. He was one of the best types of clinical physicians and teachers, as shown in his interest in the individual patients under his care, and in his power of lucid speaking and exposition which were greatly appreciated by his students. He had that wide general knowledge of medicine, best adapted for the needs of the general student. In the students he took the greatest personal interest; he never spared himself any pains in meeting their needs or carrying out most faithfully and systematically the teaching and lectures which he had taken in hand. The contributions which he made in various papers to the subject of general medicine were always marked by the same care. But as regards his published work, his most important contributions were those relating to skin diseases in which he retained his special interest to the last. His wide knowledge of the subject was specially helpful when he brought it into relation with his general medical experience, as he did in opening the important discussion on Skin Diseases in Relation to Internal Disorders which was held in the Medical Society in 1921, and was destined to be his last contribution to the subject.

He had many interests over and above those connected with his professional work. The chief of these was his love of field studies, of botany, biology, and geology, of antiquarian studies and researches in Old London, and indeed in every place where he spent the scanty time which he got free from his professional work. His interest in antiquarian work was very great and his knowledge and acquaintance with it very widespread and deep. His work, entitled "Historical Studies of Old Charing: The Hospital and Chapel of Saint Mary Roncevall, and on Eleanor of Castile, Queen of England, and the Monuments Erected in Her Memory," published in 1914, is one of the highest merit and distinction—a fascinating study of Old London and the old foreign Spanish monastic institution of St. Mary Roncevall which existed for three centuries (1219–1559) on the site now occupied by the Charing Cross Station and Northumberland-avenue. The same interest attaches to his story of the crosses erected to Queen Eleanor of Castile scattered along the route of her last conveyance to Charing Cross, London. These studies reveal a deep knowledge of ecclesiastical history.

Dr. J. M. H. MacLeod writes: Galloway while physician for skin diseases at Charing Cross was an indefatigable worker; his appointment as full physician led to his becoming consultant dermatologist, but he continued to watch over this department with the warmest interest. Outside the hospital he was an active member of the dermatological societies, and only a few years ago was honoured by being elected President of the Dermatological Section of the Royal Society of Medicine. In his earlier days he was a prolific writer on dermatological subjects. From 1896 to 1904 he edited the *British Journal of Dermatology*, and during his régime that journal achieved a success which has not been surpassed, both with regard to the form and the matter and to the almost meticulous care which he took over the reports of the dermatological societies, and the abstracts of current literature. Though not responsible for a text-book, he contributed numerous articles to systems and dictionaries of medicine and to contemporary journals. His most important papers were concerned with the relation of skin manifestations to general derangements, such as the Nature of the Skin Lesions in Nervous Diseases, Erythematous Indications of Disease, the Cutaneous Manifestations of Gout and Rheumatism, and subjects of a kindred nature. The leading characteristic in these writings was a careful marshalling of known facts, a sane commentary on them, and the avoidance of unproved theories or hypotheses. He approached the subject of skin diseases from the general medical standpoint, coming to them with a sound knowledge of general medicine, both clinical and pathological, and he invariably insisted that the proper education for a specialist was to become a general physician first. His loss will be deeply felt among his dermatological colleagues.

Sir Frederick Mott writes: I first knew Galloway when he was appointed to the Skin Department of Charing Cross Hospital. He soon made a reputation as an expert dermatologist and teacher. But he always recognised that dermatology was a part of general medicine, and later his ambition of becoming a physician on the general staff was realised. The same success which attended his teaching and practice in the skin department was achieved in his teaching and practice of clinical medicine. Up to the last he took especial interest in demonstrating to students a skin case which his special knowledge enabled him to discuss fully and with the authority of an expert. He was, however, a remarkably good general physician, for he not only taught his students the value of systematic methods in the diagnosis and therapeutic treatment of disease, but what was of signal moment he impressed them with the importance of inspiring confidence in the patient. This he did by his kindly, courteous, and genial personality and the human sympathy he invariably showed for the sufferer. Galloway was a loyal colleague and a good friend. He was not only of great service to the hospital and medical school as a physician and teacher of medicine, but his wisdom, sound judgment, and tactfulness, combined with the power of expressing himself clearly and logically, made him of inestimable value in the school committee and council of the hospital. It was, no doubt, this rare combination of qualities as a physician and a man which fitted him for the important post he held during the war, and the success which attended his efforts. I would like to say that his death came as a shock, for I regarded him as an old friend and colleague whom I respected for his fine character and admired for his great abilities.

HUGH WHITWELL, M.R.C.S. ENG.

THE death is recorded after an operation of Dr. H. Whitwell, one of the leading medical practitioners of Norwich, at the early age of 46. He was educated at Uppingham, Cambridge University, and St. Bartholomew's Hospital. After qualifying as M.R.C.S., L.R.C.P. in 1901, he was elected a house physician to this hospital. He settled in Norwich about 18 years ago as a partner with Dr. H. S. Robinson and Mr. H. C. Nance, on whose retirement he was joined by Mr. B. B. Riviere. He had a very large practice, both in Norwich and in the county, and had served for some years on the staff of the Jenny Lind Infirmary for Children, being at the time of his death senior surgeon to the institution. During the war he served for two and a half years in France, first with the Yorkshire Hussars, and afterwards as surgical specialist at a general hospital, and was invalided out of the service in 1918. He had also acted as surgeon to the Lakenham Military Hospital in Norwich. Dr. Whitwell was unmarried, and was a keen sportsman. He loved hunting, fishing, and golf, at which he excelled. He also excelled at one-design yacht-racing on the Broads, and before coming to Norwich had played cricket for the Yorkshire Gentlemen.

Dr. Whitwell was very popular in Norwich, and will be mourned alike by patients, friends, and colleagues.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. (retd.) E. A. Penfold to be Surg. Rear-Admiral retd.

Surg. Lts. to be Surg. Lt.-Comdrs.: O. J. M. Kerrigan, J. J. Carroll, and C. N. Ratcliffe.

ROYAL ARMY MEDICAL CORPS.

Capt. J. R. N. Warburton is secd. for service with the Egyptian Army.

MILITIA.

Capt. P. S. Vickerman relinquishes his commn. and is granted the rank of Lt.-Col.

TERRITORIAL ARMY.

The undermentioned resign their commns. and retain their rank except where otherwise stated: Lt.-Cols. A. H. Vernon (with permission to wear the prescribed uniform) and C. M. Kennedy; Majs. C. J. Martin (with permission to wear the prescribed uniform), F. E. Stokes, and T. M. Jamieson.

Maj. E. G. Stocker, having attained the age limit, is retired, and retains the rank of Maj., with permission to wear the prescribed uniform.

Capt. A. Silbermann, having attained the age limit, is retired, and retains the rank of Capt.

Capt. J. M. Smeaton (late R.A.M.C.) to be Capt.

Capt. W. I. Cumberlidge relinquishes his commn. and retains the rank of Capt.

INDIAN MEDICAL SERVICE.

Capts. J. Scott (Bt. Maj.), F. W. Hay, G. Tate, S. M. Hepworth, H. S. Cormack, Krishnan Gopinath Pandalai, and Jyoti Lal Sen to be Majs.

Medical News.

UNIVERSITY OF CAMBRIDGE.—The following candidate is the first to satisfy the examiners in both parts of the examination for the Diploma of Hygiene established by the University for foreign medical graduates: Chung Hsin Han (Non-Coll.) (distinguished in the Principles of Hygiene).

The following candidates have now satisfied the examiners in both parts of the examination for the Diploma in Public Health:—

Marjorie Back, Muriel J. Brown, James G. Campbell, James Davidson, Robert A. Forsyth, Alan W. Gaye, Beryl Grieve, James G. F. Hosken (distinguished in the Principles of Hygiene), Ewen S. Macphee, Daulat Ram Mehta, Donald E. Morley, Edith M. Neilson, Sybil M. Nuttall, George P. N. Richardson, Theodore E. Roberts, Henry A. Ross, George M. Sanderson (distinguished in the Application of Sanitary Science), Henry E. Sciler, William A. Werden, and John Young.

UNIVERSITY OF EDINBURGH.—At the graduation ceremonial held on Oct. 21st the following degrees were conferred:—

M.B., B.S.—James William Anderson and Frank Booth.
Diploma in Public Health.—Jean Murray.

UNIVERSITY OF GLASGOW.—The following degrees have been conferred:—

M.D.—Alexander Scott (honours), William M'Kendrick (high commendation), and Duncan Cameron.
Ch.M.—Spencer Mort.
D.Sc.—Walter Elliot Elliot.
M.B., Ch.B.—With honours: Robert Campbell Garry. With commendation: Catherine Harrower, Robert Crawford, James Grant, Alexander T. Hastie, Catharine Boyd, Thomas W. Davidson, Robert C. Hamilton, Mary P. MacCunn, William D. Hood, Arthur Anderson, James W. Hamilton, Thomas Nicol, James H. Ramage, Thomas W. Howie, and James Cook.
Alexander W. Aird, Margaret Alexander, Robert G. M. Alexander, Isabel P. Allan, Andrew Anderson, William C. Andrew, Margaret R. Balloch, Abraham L. Bernstein, Catherine A. S. Blair, Mary MacQueen Bonnyman, Mary D. A. Boyd, Frederick A. Brown, Robert O. Bruce, Barbara A. Cameron, Janet R. Campbell, Margaret E. Campbell, Margaret G. Carrick, Nora T. Cassidy, Gladys M. Chapell, Horace Collingbourne, Margaret E. Colville, Elizabeth S. Cook, John S. Cook, Gerhardus C. Cruijwagen, John S. Currie, Isabella C. Darling, Agnes C. J. Davidson, Margaret Davidson, James Dawson, Isabelle A. Deans, Agnes F. Dickson, Lilian M. Dickson, James S. Donaldson, Alexander F. Dunn, Amy M. Fleming, Elizabeth H. Forrest, Andrew Fyfe, Archibald Gardiner, Andrew V. Garscadden, Emmie C. Gibb, Thomas Gibson, Jean M. Gilchrist, Margaret B. Graham, Ross A. Grant, William N. Gray, Hugh G. Halliday, Mary N. Hendry, George J. Hutchison, Elizabeth G. Jamieson, Jessie M'Leod C. Jamieson, Mary K. Jeffrey, Tudor J. Jones, Frederick C. Laing, James E. S. Lee, Alexander Leitch, James Lindsay, George W. Lochhead, Isabella Lumsden, William W. Lundie, Herbert M'Cluskey, Joan A. MacColl, John W. M'Conville, Allan A. Macdonald, Chrissiebelle Macdonald, Thomas J. M'Kail, Kenneth W. MacKenzie, Marion A. M'Kenzie, George MacKerracher, Murdoch M'Lean, Neil A. MacLean, Samuel M'Mahon, Robert C. MacMurray, Andrew M'Nulty, Marion L. M'Quaker, Mary M'Quaker, Doris M'Walter, Agnes L. Mair, Donald C. Marshall, Donald V. Marshall, Hugh R. Melville, Elizabeth W. Miller, John H. Miller, Alexander Mitchell, William T. Mitchell, David R. MacPherson Morrison, Ellen D. Morton, William Muir, James P. Neilson, Sarah H. Nelson, Elizabeth K. Nicholson, James Nicholson, James L. Orr, John A. R. Oswald, Marcus G. Pezaro, Louise B. Pollok, Thomas C. Porter, Mary E. Proudlove, Thomas D. Pyle, John S. Ramage, Elizabeth C. Rodger, Bessie S. Ross, Sarah Ross, John Russell, Bertha E. A. Sharpe, William Simpson, Christina R. I. Sloan, Andrew Snaddon, James Sommerville, Jack F. M. Stenhouse, Effie S. Stephen, Mary MacPherson Stevenson, Jeanie M. Strathie, Thomas Tannahill, Hamilton G. B. Teggart, Robert W. Todd, Margaret S. Watt, Jemima Waugh, Janet A. O. Weir, Alexander F. Whyte, Catherine B. Wilson, James H. Wilson, John W. Wilson, Joseph H. Wright, Grace M. Young, and John A. K. Young.

Mr. Robert Campbell Garry, who graduated on Oct. 16th, gains the Brunton Memorial Prize of £10 awarded to the most distinguished graduate in medicine of the year.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations recently held the following have been successful:—

THIRD EXAMINATION.

Frederick W. Robinson, Darwish Moustafa Safwat, Kathleen M. R. Dunn, Isaac Chesarkie, William T. Baker, Peter King, Edward T. Hale, Charles M. Hinds, William M. B. Rossie, John C. Colvin, John P. T. Mills, Jemima M. McKendrick, Hector C. Reed, Mary C. Semple, Mohammed Mustafa El-Makkawi, John A. McCann, Anna G. Laubscher, James G. Currie, Tom G. S. Harkness, Joseph McAuley, James Brydone, David K. Fisher, Robert D. Scorgie, and Abraham M. Filer.

Pathology.—James K. Hunter, Alastair F. B. Mackay, James M. Rutherford, Moss M. Bronstein, George R. Mitchell, and Hugh C. G. Cameron.
Materia Medica.—James Ryan, Elizabeth M. McKendrick, Harold V. Ritchie-McKinlay, Donald L. Crawford, and John C. Shiach.

FINAL EXAMINATION.

John E. Overstead, Adriaan Vintcent Bergh, Andrew A. Dewar, Samuel I. T. Wills, Marjory J. A. Ogilvie, James A. M. S. Evers, Pincus Schneiderman, Lilian M. Williams, Peter B. Fernando, Wilson O. Rodrigo, Leslie I. Myerson, Solomon J. Rom, James M. McInnes, Cecil J. Cellan-Jones, William L. Murray, Isabel F. King, Thomas T. Hoskins, Ferdinand H. A. Stegmann, Sathasivam Ponniah, and Peter J. B. Dyce.
Medicine.—Beatrice M. Niven, Charles J. B. Fox, Hilda Page, John B. Rodrigo, Katherine M. Cellan-Jones, Ernest Brazao, and James M. Crombie.
Surgery.—Charles J. B. Fox, William Paris, John B. Rodrigo, Daniel Maximos, and James M. Crombie.
Midwifery.—Beatrice M. Niven, El Saeed el Gohary Sheir, Don Valentine Walpola, Behari Lal Chopra, Oliver H. D. Oliver, and Ernest Brazao.
Medical Jurisprudence.—Richard F. Pagnam, William J. Rankine, Annie H. Sutherland, William D. Howat, Leslie L. Armstrong, Arthur H. Stephenson, Donald Jack, George A. P. McConey, James Courtney, William E. Haydon, Charles J. Coventry, William N. Stirling, Ernest Levine, James Donnelly, and James Kirkness.

DIPLOMA IN PUBLIC HEALTH.

Douglas J. A. Kerr, Jane W. Macdonald, Gertrude D. MacLaren, Andrew Climie, Jean MacIver Mackintosh, Mary Steven, Agnes H. M. Young, Ralph C. L. Batchelor, Annie M. Alexander, John A. Fraser, Alexander Jos, James H. Clarke, Douglas R. Cramb, Richard J. O. Taylor, Mary L. Wilson, Christian M. Fleming, Joseph McCulloch, Eileen R. Freeman, Marion C. Taylor, and John McGarrity.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Oct. 18th Sir David Wallace was re-elected President for the ensuing year, Dr. George Mackay Vice-President, and Mr. Alexander Miles Secretary and Treasurer.

The following 19 candidates who passed the requisite examinations in July, 1922, were admitted Fellows:—

Peter M. Brodie, William A. Brown, Donald Buchanan, Joseph T. Carson, John S. M. Connell, Josias Daneel, Elon Lamont Ferguson, Henry L. H. Greer, Charles R. R. Huxtable, Marjorie M. Jefferson, Ivan Bede Jose, Leonard C. E. Lindon, George A. Petrie, Edwin D. Pullon, Bertie S. Simpson, Hari Vishwaneth Tilak, Vernon N. Whitamore, James L. Will, and Ethel D. Willis.
Dr. Kandappah Rajah was admitted a Licentiate.

MIDLAND MEDICAL SOCIETY.—The inaugural meeting for the session was held at the Queen's Hotel, Birmingham, on Oct. 25th, when Dr. Thomas Watts Eden delivered an address entitled the Mortality of Childbearing, its Causes and How to Deal with Them.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An extraordinary Comitia of the College was held on Oct. 19th, Sir Humphry Rolleston, the President, occupying the chair. The following modification of By-law CLXXVIII., passed for the first time at the last Comitia, was now passed for the second time:—

No Fellow of the College shall be engaged in trade, or dispense medicines, or make any engagement with a Pharmacist or any other person for the supply of medicines, or practise Medicine or Surgery in partnership, by deed or otherwise; or be party to the transfer of patients or of the goodwill of a Practice to or from himself for a pecuniary consideration.

By-law CLXXVIII. formerly read as follows:—

No Fellow *or Member* of the College shall be engaged in trade, or dispense medicines, or make any engagement with a *Chemist* or any other person for the supply of medicines, or practise Medicine or Surgery in partnership, by deed or otherwise; or be party to the transfer of patients or of the goodwill of a Practice to or from himself for a pecuniary consideration. [Words altered or omitted are printed in italics.]

The following resolution was passed for the first time:—

That By-law CXIV., which relates to candidates for the Membership and which reads as follows, be repealed: No candidate shall be admitted to examination who is engaged in trade, or who dispenses medicine, or makes any arrangement with a Chemist or any other person for the supply of medicines; or who practises Medicine or Surgery in partnership, so long as that partnership continues.

The following resolution was passed to take the place of the resolution passed by the College on Oct. 25th, 1888:—

That, subject to the provisions of By-law CXC., it is undesirable that any Fellow or Member of the College should have any financial interest (whether direct or indirect) in any Company or Institution having for its object the treatment of disease for profit other than the receipt by him of (1) a fixed salary, or (2) fees, for such services as he may render to such Company or Institution in his capacity of medical practitioner.

The resolution passed on Oct. 25th, 1888, read as follows:—

That it is undesirable that any Fellow or Member of the College should be officially connected with any Company having for its object the treatment of disease for profit.

The President then dissolved the Comitia.

MEDICAL PRACTITIONERS' UNION.—The second annual dinner and dance will be held at the Holborn Restaurant, London, W.C., on Nov. 9th, at 7 P.M.

Prof. Arthur Smithells, who has held the chair of chemistry at the Yorkshire College and the University of Leeds since 1885, will retire at the end of the present session and take up special chemical research work in London.

DONATIONS AND BEQUESTS.—By the will of the late Mr. Harry Carr Gibbs, of Queen Anne's Mansions, St. James's Park, London, the testator left £1000 each to the Royal Society for the Prevention of Cruelty to Children, the General Lying-in Hospital, York-road, Lambeth, the St. Dunstan's Home for Blinded Sailors and Soldiers, and the Lord Mayor Treloar's Home for Crippled Children, Alton.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Oct. 18th, Mr. H. J. Waring, the Vice-Chancellor, being in the chair, a communication was received from the Minister of Health forwarding draft heads of agreement with reference to the School of Hygiene which is to be established as a school of the University under the donation of two million dollars made for the purpose by the Rockefeller Foundation. These provide for the erection of suitable buildings on a site in Bloomsbury and the constitution of a board of management and a court of governors for the control and administration of the school. Resolutions were adopted expressing the concurrence of the University in the proposed scheme and the very great satisfaction with which the Senate have learnt of the munificent contribution of the Rockefeller Foundation and of the intentions of H.M. Government with regard to the maintenance of the school.

A course of eight lectures on the Histology of the Nervous System is being given by Dr. A. Da Fano at King's College (Strand), on Wednesdays, at 4.30 P.M. The first lecture was delivered on Oct. 25th, and subsequent ones will be given on Nov. 1st, 8th, 15th, 22nd, and 29th, Dec. 6th and 13th. Attendance at this course is recognised in connexion with the B.Sc. (Honours) degree in Physiology. Admission is free without ticket.

INTERNATIONAL MORALS CONFERENCE.—An International Conference on the Reaffirmation of the World's Moral Ideal was held at Caxton Hall and Westminster Congregational Church, London, S.W., on Oct. 17th, 18th, and 19th. On the 17th the afternoon session was devoted to a discussion of "Marriage and Parenthood" and "The Relation of the Sexes." Dr. Mary Scharlieb, who presided, described the chief difficulty of the conference as arising from the fact that practically there was no ideal to reaffirm. Ideals had been shattered by the events of the past eight years; laxity, self-indulgence, and indifference to all forms of religion formed the key to present troubles. In modern literature vice, self-seeking, disregard for the rights of others, and indifference to duty were not only tolerated, but praised. The Rev. Dr. R. F. Horton was anxious for a modification of the divorce laws in order to make relief possible for all classes where conditions had rendered a marriage intolerable. Yet, he said, the youth of the country must be shown the beauty of lifelong fidelity in marriage; the homes of the inviolable marriage-tie were the backbone of the country—let them contrast the children of these homes with the offspring of adulterous unions. Dr. C. J. Bond emphasised the importance of the biological factor in human development. Lofty ideals, he said, did not grow in the diseased or imperfectly developed brain. Given the necessary minimum of knowledge of eugenics and rudimentary racial conscience, much could be done in one generation to reduce the legacy of human inefficiency and misery. It was the duty of the State to see that no boy or girl left school without definite instruction as to the meaning and the right living of sex life. Mrs. H. B. Irving contrasted the morals of 50 years ago with those of to-day, and pointed out that the evil existing to-day was no longer hidden. Two chief causes of sex immorality were bad housing and lack of proper teaching to children and adolescents, especially boys. Devoted mothers still regarded it as normal for a young man to sow his wild oats, and this thought was, she believed, the root of modern laxity. The alleged increase of divorce, illegitimacy, and venereal disease should not be accepted as proof of moral degeneration without some study of their causes. It was impossible to improve the status of woman without making her less willing to submit to indignity and suffering. If an equal moral standard was wanted for the sexes, early marriages were necessary; connected with this question was that of some form of birth-control. Dr. H. Crichton Miller described successful parenthood as the most permanent and satisfying experience upon earth. Children must be taught that it is a privilege to be striven for. The sex function was to be regarded as the most solemn act of trusteeship, and when this fact was recognised there would be no need to speak about birth-control, chastity, and liberty.

RESEARCH INSTITUTE IN DAVOS.—The Institute, intended primarily for hæmatological research, is to be opened in Davos on Nov. 11th or 12th. The local medical profession both in Davos and Arosa took part in the foundation ceremony last spring. It is hoped that Prof. Adolf Loewi, of Berlin, well known from his joint investigations with Prof. Zuntz, will undertake to direct the Institute and to continue there the physical measurements carried out in Davos years ago by Prof. Dorno. A pathological and bacteriological section is attached to the Institute. It may be added that since the autumn of last year a small research institute in heliotherapy has been in action at Arosa, in charge of a previous assistant of Prof. Dorno. Unfortunately the summer in the Alps, as elsewhere, has not been sunny.

ANNUAL DINNER OF THE SOCIETY OF M.O.H's.—Dr. T. Eustace Hill presided at the annual dinner of the Society of Medical Officers of Health, held at the Hotel Cecil, London, on Friday, Oct. 20th. The society now numbers more than 1700 members and seven specialist groups, all of which were well represented at the dinner. In the absence of Sir Alfred Mond, the Dean of St. Paul's proposed the toast of "The Society," in which, after critically examining some of the achievements of preventive medicine, he expressed his conviction that preventive medicine should lead on to eugenics. Dr. Hill, in response, detailed some of the efforts made by the public health service for improving the environment of the people, and warmly acknowledged the help of voluntary effort. Owing to such help the cost of the M. and C. W. services was only some 2 per cent. of that of total public health expenditure. He welcomed the superannuation scheme for medical officers of health, bringing them into line with Poor-law officers and civil servants, but regretted that the regulation was only permissive on local authorities. Dr. W. J. Howarth, in proposing "The Guests," spoke of the fearlessness with which Dean Inge approached public health problems. Some clergymen claimed a call to the cure of disease; Dr. Howarth suggested that any time left from spiritual duties might rather be devoted to the prevention of disease. He referred gratefully to the work of Sir Herbert Nield in piloting through Parliament the Superannuation Bill for municipal officers. Sir Herbert Nield, in response, gave an interesting account of the vicissitudes of the Superannuation Bill in both Houses. He expressed the hope that all local authorities would adopt the Act. Sir Humphry Rolleston and Sir Anthony Bowlby also replied. The toast of "The President" was ably proposed by Dr. Sidney Barwise. The occasion was marked throughout by the friendly social intercourse associated with the public functions of this society.

ROYAL MEDICAL SOCIETY, EDINBURGH.—The 186th session of the Royal Medical Society's activities began with an inaugural address by Dr. Byrom Bramwell on Oct. 20th. He took as his subject his own student days in Edinburgh and the teachers of that time, and gave an illuminating picture of life in the Edinburgh medical school over half a century ago. The men who occupied the professorial chairs when he entered Edinburgh University as a medical student in 1865 were indeed giants in the land. The famous Playfair was professor of chemistry, and the success of his class experiments was in no small measure due to his assistant, now Sir James Dewar, inventor of cordite and the thermos flask. The professor of anatomy was Goodsir, who had a reputation as the most philosophic anatomist of his day. Physiology was taught by John Hughes Bennett, equally distinguished as a clinician. Bennett was the first to teach the systematic use of the microscope in this country, the first to use cod-liver oil in therapeutic practice, and the first to identify leucocythæmia. He gave the knock-out blow to the practice of bleeding, and was a great supporter of the Royal Medical Society. Robert Christison was professor of materia medica, and his work on poisons was for many years a standard one. Clinical surgery was taught by Syme, remarkable not only for his pre-eminence as a surgeon, but for the fact that the fifth edition of his text-book was smaller than the first; while systematic surgery was expounded by Spence, who practised lithotomy so assiduously that it was said his idea of Heaven was "to be perpetually employed cutting the damned for stones." Laycock, professor of medicine, was a great medical philosopher. He was the first to introduce a course of medical psychology in this country, and anticipated Hughlings Jackson's conception of three levels in the nervous system. The most remarkable man among them all was J. Y. Simpson, professor of midwifery, whose contribution to the science of obstetrics and whose services to humanity in introducing chloroform are known to all. Dr. Bramwell described many others among his teachers, only less famous than those mentioned above, and no listener could fail to be impressed by the remarkable group of personalities collected together in the Edinburgh Medical School of the middle of the nineteenth century.

THE Huxley lecture on Evolutionary Tendencies in Man's Body will be given at the Charing Cross Hospital Medical School by Sir Arthur Keith, F.R.S., at 3 P.M., on Nov. 8th. The chair will be taken by Dr. William Hunter. Admission free without ticket.

GUILD OF ST. LUKE: ANNUAL SERVICE.—On Oct. 18th the annual evening service of the Guild was held in St. Paul's Cathedral. A short sermon was preached by the Rev. Lord Victor Seymour, whose text was "Only Luke is with me." Between 40 and 50 medical men and students attended in academic dress and took part in the solemn procession at the conclusion of the service.

ST. LUKE'S DAY SERVICE IN LIVERPOOL.—The annual medical service was held in St. Luke's Church, Liverpool, on Oct. 22nd, the preacher being Bishop Ryle, Dean of Westminster. The Lord Mayor attended in state, accompanied by the Lady Mayoress, and a large congregation assembled of medical men with their wives and families and a fair sprinkling of members of the nursing profession. The service was conducted by the Rev. W. Macdonald and the lesson read by the Lord Bishop of Liverpool. A collection on behalf of the Royal Medical Benevolent Institution yielded over £65.

CHADWICK PUBLIC LECTURES.—At the Royal Institute of British Architects, 9, Conduit-street, London, W., on Oct. 26th, Dr. Leonard Hill, F.R.S., lectured on Ventilation and Atmosphere, Sir William Collins presiding. On Nov. 8th Dr. Hill will lecture at the Textile Institute, St. Mary's Parsonage, Manchester, on the same subject, Prof. A. W. Crossley presiding. On Nov. 14th, at 5.15 P.M., Miss A. D. Muncaster will lecture on Some Hygienic Aspects of Food and Food Preparation at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, Sir William Collins presiding. On Dec. 7th and 14th, at 5.15 P.M., in the Barnes Hall, Royal Society of Medicine, 1, Wimpole-street, London, W., Sir Arthur Newsholme will lecture on Relative Values in Public Health, Sir James Crichton-Browne presiding. On Feb. 1st and 8th, at 8 P.M., at the Royal Institute of British Architects, 9, Conduit-street, London, W., Mr. G. Topham Forrest will lecture on London's Unhealthy Areas, the chair being taken by Mr. John Slater and Mr. W. E. Riley respectively.

POST-GRADUATE MEDICAL TEACHING IN GLASGOW. The syllabus for the winter session of the Glasgow Post-Graduate Medical Association, of which Sir Donald MacAlister is chairman and Sir Hector C. Cameron vice-chairman, has been issued. Post-graduate teaching in Glasgow is now available from November till May in three forms—viz., weekly demonstrations, special courses, and clinical assistantships. The series of weekly demonstrations are of special value to those practitioners who wish to keep in touch with recent advances, and to compare the methods of diagnosis and treatment employed in different institutions. An additional feature of the course this year will be the demonstration and discussion of cases sent by graduates attending the course. The demonstrations will be held each Wednesday afternoon at 4.15 P.M. from Nov. 1st to May 29th. The fee for the course is £3 3*s.*, and graduates should enrol with the secretary, the University, Glasgow. Special courses have been arranged for limited numbers to provide opportunities for serious clinical study. A course on medical ophthalmology will be conducted by members of the staffs of the Eye Infirmary, the Ophthalmic Institution, and the General Hospitals. The aim of these clinical meetings is to demonstrate the importance of ocular conditions in the diagnosis and prognosis of general disease, as well as the part played by constitutional disease in the causation of those conditions which come within the province of the ophthalmic surgeon. The meetings will be held at 4 P.M., and the first will take place on Jan. 16th, 1923, at the Eye Infirmary. Graduates who wish to enrol for the course should communicate with, and pay the fee (£2 2*s.*) to, the secretary, Post-Graduate Medical Association, The University, Glasgow. Two courses, one before and one after Christmas, will be held on the Mother and the New-born Infant. At the Royal Maternity and Women's Hospital there will be three clinical meetings, at which Dr. D. Shannon will demonstrate various complications of parturition, and will show the methods of antenatal supervision which are being carried out in the antenatal wards and dispensary at the hospital. The gynæcological conditions resulting from childbirth will be dealt with at the Royal Infirmary by Prof. Munro Kerr and Dr. J. Hendry, special reference being made to the prevention of fœtal injuries and death. The care of the infant and of the new-born child will be discussed by Dr. Leonard Findlay during three clinical meetings to be held at the Royal Infirmary. Certain aspects of the pathology of the fœtus and of the new-born infant will be demonstrated by Dr. J. N. Cruickshank in the research department of the Maternity Hospital. The first meeting will take place on Nov. 2nd, at 4.15 P.M., at the Royal Infirmary. The fee for each course is £2 2*s.*; application should be made to the secretary of the Association. Courses on Nervous Disease (with special reference to syphilis), Surgical Diseases of Children, and Clinical Psychiatry can also be taken. Application should be made to the Medical Superintendent, Western Infirmary, Mr. A. Maclennan, Royal Hospital for Sick Children, and Dr. J. H. Macdonald, Hawkhead Mental Hospital, respectively.

ROYAL SUSSEX COUNTY HOSPITAL.—As a result of criticism levelled against the governors of the Royal Sussex County Hospital for closing four wards on Oct. 1st, a meeting was held on Oct. 16th, presided over by Alderman E. J. Pankhurst, the mayor. The governors had taken into consultation Mr. F. G. Hazell, superintendent and secretary of the Royal Infirmary, Manchester, and as the result of a close examination of the accounts with those of other comparable hospitals in the country, came to the conclusion that it was most economically conducted. The income from annual subscriptions, in comparison with other hospitals of the same size, was only half what it should be. The income from workmen's contributions was negligible, being only 3 per cent. as opposed to 23 per cent. average of the voluntary general hospitals throughout the country. The great weakness in the financial position was lack of dependable income. The hospital received no less than 42 per cent. of its entire income from donations, and practically half that amount was contributed through the efforts of one supporter. Mr. R. Ball Dodson, chairman of the governors, in a survey covering a decade, said not only had legacies supplied over £1000 a year by way of endowments in that period, but it was from legacies that the annual deficiency had been made up. But large legacies could no longer be expected. Mr. Dodson declared that he saw no prospect of running the hospital with a daily average of 200 beds occupied, and all its auxiliary work, at a cost of less than £35,000 a year. The annual subscriptions should reach at least £10,000 a year; every family living in a house or flat of £50 a year or more rent could, and should, pay an annual subscription of 1 per cent. of that rent without feeling it. There was also the contributory scheme of payment by the patients, and still further the Sussex Provident Scheme, from which sources a considerable income should be derived. On the proposition of the mayor, a Hospital Week is to be held in the early part of December; and the meeting carried a resolution appointing a committee of governors and subscribers, but not including any member of the board of management, to inspect all accounts, and to consider and advise as to fresh sources of income and increased economy of administration.

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. At the fourth Congress of this Association, held at Weltevreden, Java, in August, 1921, a proposal was made on behalf of the Governments of the Straits Settlements and Federated Malay States by their delegate, Dr. A. E. Horn, and was accepted that the next Congress (1923) of the Association be held in Malaya. Dr. Horn was chosen President for the forthcoming session, Dr. A. L. Hoops and Dr. R. Dowden were elected Vice-Presidents for the Straits Settlements and Federated Malay States respectively, and Dr. J. W. Scharff as hon. secretary for Malaya. On April 21st last a meeting was held to elect committees for the organisation of the Congress. Subsequently other meetings were held, and definite schemes were prepared for the management of the Congress, which will take place from Sept. 3rd–17th, 1923. The first week of this period will be devoted to scientific discussions, and the following week to excursions to places of medical and sanitary interest throughout Malaya. The Governments of the Straits Settlements and Federated Malay States recognise the important functions of the Association and are contributing a considerable sum towards the expenses. The main object of the Association is to promote the science and art of tropical medicine in the Far East by uniting into one compact organisation the medical profession of the Far East. The diffusion of medical knowledge, the establishment of friendly international intercourse among physicians, the raising of the standard of medical education, and the enlightenment and direction of public opinion in regard to the problems of hygiene, the encouragement among the native population of customs conducive to the prevention of disease, and the publication of the results of scientific observations are also among its aims. The Association consists of the members of all regularly organised medical societies in the East, and all medical officials in the civil, military, naval, or other organised services of Governments. Those who wish to submit papers to the Congress are asked to communicate as soon as possible with the hon. secretary, Dr. J. W. Scharff, Government Health Officer, Singapore.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Wednesday, Nov. 1st.

SURGERY: at 5.30 P.M.
Presidential Address:
Mr. James Berry: The Progress of Surgery and the Rise and Fall of Surgical Operations.
To be followed by a discussion, in which Sir John Bland-Sutton, Mr. Percy Sargent, and Sir John Thomson-Walker will take part.
An Exhibition of museum specimens of tumours of the lower jaw will be on view from 4.30 P.M.

Friday, Nov. 3rd.

LARYNGOLOGY: at 4.45 P.M. (Cases at 4 P.M.)
Cases and Specimens will be shown by Dr. Dan McKenzie, Mr. W. H. Ogilvie, Sir James Dundas-Grant, Mr. C. A. S. Ridout, and Mr. A. J. Wright.
Epidiascope Demonstration:
By Dr. Irwin Moore on Operative Procedures in the Treatment of Bilateral Paralysis of the Abductor Muscles.

ANÆSTHETICS: at 8.30 P.M.
Paper:
Dr. Herbert R. Spencer: The Anæsthetisation of Patients for the Classical Cæsarean Section.
To be followed by a discussion.

OBSTETRICS AND GYNÆCOLOGY: Members of this Section are specially invited to attend the above meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Oct. 30th.—8.30 P.M., Clinical Evening. Exhibition of Cases and Radiograms illustrating Tumours of the Abdomen (excluding Tumours of the Female Appendages). Cases and Radiograms will be exhibited by Dr. Walter Carr, Dr. Arthur F. Voelcker, Dr. F. J. Poynton, Mr. Herbert W. Carson, Mr. Cecil Rowntree, Mr. Clifford Morson, Mr. C. A. Pannett, Dr. Douglas Frith, Mr. H. E. Griffiths, Sir Archibald Reid, and others. Cases will be in attendance at 8 P.M.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.
THURSDAY, Nov. 2nd.—5 P.M., Bradshaw Lecture:—Sir Maurice Craig: Mental Symptoms in Physical Disease.

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W.
TUESDAY, Oct. 31st.—5 P.M., Dr. C. E. Lakin: Indigestion.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Oct. 30th.—10.30 A.M., Mr. Maingot: Surgical Pathology. 12.15 P.M., Dr. Burnford: Pathological Demonstration. 4.30 P.M., Dr. Saunders: Meningitis in Children and its Treatment.
TUESDAY.—10 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon, Mr. Sinclair: Surgical Diseases of Abdomen. 4.30 P.M., Mr. Tyrrell Gray: Surgical Aspects of Dyspepsia.
WEDNESDAY, Nov. 1st.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12 noon, Mr. Simmonds: Demonstration of Fractures. 4.30 P.M., Mr. D. Armour: Surgery of the Pancreas.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Dr. Scott Pinchin: Disease of the Heart. 4.30 P.M., Dr. Legge: Industrial Conditions, Past and Present.
FRIDAY.—11 A.M., Dr. McDougal: Electrical Department. 12.15 P.M., Dr. Burnford: Applied Pathology. 4.30 P.M., Dr. Owen: Diagnosis of Renal Disease.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Simmonds: Orthopædics.
Daily, 10 A.M. to 6 P.M., Saturdays 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION St. James' Hospital, Ouseley-road, Balham.
THURSDAY, Nov. 2nd.—4 P.M., Prof. T. Pigg Strangeways: Rheumatoid Arthritis: its Varieties and their Treatment.

NORTH-EAST LONDON CLINICAL SOCIETY, Prince of Wales's Hospital, Tottenham, N.
WEDNESDAY, Nov. 1st.—4.15 P.M., Mr. H. W. Carson: Preliminary Treatment in Acute Abdominal Disease (followed by discussion). Exhibition of Cases by members of the Society.

LONDON LOCK HOSPITAL, 91, Dean-street, W.
TUESDAY, Oct. 31st.—2.30 P.M., Mr. McDonagh: Microscopic Demonstration of Leucocytozoon Syphilidis.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: OCT.–DEC., 1922.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Oct. 30th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Lecture:—X Ray Demonstration: Dr. Russell Reynolds.
TUESDAY, Oct. 31st.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Lecture:—Syphilitic Disease of the Nervous System: Dr. Hinds Howell.
THURSDAY, Nov. 2nd.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Clinical Lecture: Dr. Grainger Stewart.
FRIDAY, Nov. 3rd.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Lecture:—Aphasia: Dr. Collier.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Lecture on NEURO-OPHTHALMOLOGY (in the Lecture Theatre). WEDNESDAY, Nov. 1st.—3.30 P.M., Optic Atrophy: Mr. Leslie Paton.
N.B.—Not more than fourteen candidates can attend this Course.
Lectures on NEURO-PATHOLOGY. MONDAY, Oct. 30th.—12 noon, Neuroglial and Vascular Reactions in the Central Nervous System. THURSDAY, Nov. 2nd.—12 noon, the Paths of Infection of the Central Nervous System: Dr. J. Godwin Greenfield.
The fee for the whole Course, including Mr. Paton's lectures, is £14 14s., but these Lectures may be taken separately for a fee of £6 6s. Any part of the Course may be taken separately at a special fee. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
C. M. HINDS HOWELL, Dean of Medical School.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
THURSDAY, Nov. 2nd.—5 P.M., Dr. W. Griffith: The Pathology of Skin Diseases.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W. 1.
MONDAY, Oct. 30th.—5.30 P.M., Sir Sydney Russell-Wells: Diseases of the Endocardium.

ANCOATS HOSPITAL POST-GRADUATE LECTURES.
THURSDAY, Nov. 2nd.—4.30 P.M., Dr. Arnold Renshaw: Diabetes.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, Oct. 31st.—4.15 P.M., Dr. F. Craven Moore: Jaundice.
FRIDAY, Nov. 3rd.—4.15 P.M., Dr. E. S. Reynolds: Paraplegia.

MANCHESTER FRENCH HOSPITAL, 24, Acomb-street, Whitworth Park.
THURSDAY, Nov. 2nd.—4.30 P.M., Mr. Howard Buck: Surgical Affections of the Liver.

UNIVERSITY OF SHEFFIELD—FACULTY OF MEDICINE. Post-Graduate Lectures and Demonstrations.
TUESDAY, Oct. 31st.—3 P.M. (at the Jessop Hospital), Prof. Phillips: Puerperal Infection. 4 P.M., Dr. Naish: Demonstration of Cases in Infants.
FRIDAY, Nov. 3rd.—3 P.M. (at the Royal Hospital), Mr. Hay: The Practitioner and the Prevention of Squint. 4 P.M., Mr. Morrell: Modern Methods of Abdominal Examination by the Opaque Meal (illustrated).

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
Course of Lectures on Maternity, Child Welfare, and School Hygiene.
WEDNESDAY, Nov. 1st.—4 P.M., Dr. W. M. Feldman: Prenatal Hygiene and Problems of Maternity and Child Welfare.

Appointments.

BANISTER, T. E., M.B., B.Ch. Camb., M.R.C.S., L.R.C.P. Lond., has been appointed Assistant Medical Officer, Clare Hall Hospital.

BROWNLIE, W. B., M.D. Glasg., F.R.C.S. Edin., Medical Referee for Ophthalmic Cases under the Workmen's Compensation Act for County Court Circuit No. 3.

MACKENZIE, J., M.B., Ch.B. Glasg., Assistant Medical Officer, Royal Asylum of Montrose.

PANTING, L. C., M.D., B.Ch. Oxf., M.R.C.P. Lond., F.R.C.S. Eng., Honorary Consulting Surgeon to the St. Austell and District Cottage Hospital.

ROBERTS, C. S. L., M.S. Lond., F.R.C.S. Eng., Demonstrator of Midwifery, St. Bartholomew's Hospital.

Paddington Green Children's Hospital: WILLIAMSON, K. B., M.B., Ch.B. Edin., House Physician; MIDDLETON, D. S., M.B., Ch.B. Edin., House Surgeon.

Derbyshire Royal Infirmary: GIBBS, Miss K., M.R.C.S., L.R.C.P. Lond., Assistant House Surgeon and Casualty Officer; BURR, W. S., M.B., Ch.B. Edin., Ophthalmic House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Bolingbroke Hospital, Wandsworth Common, S.W.—Hon. Surg.
Bradford, Grassington Sanatorium.—Asst. Res. M.O. £250.
Burslem, Hayhood Hospital.—Res. M.O. £200.
Bury St. Edmunds, West Suffolk General Hospital.—Res. H.S. £200.
Charing Cross Hospital.—Asst. P. £100.
Charing Cross Hospital, Institute of Pathology.—Director of Pathology. £650.
City of London Hospital for Diseases of Chest, Victoria Park, E.—H.P. £125.
Denbigh, North Wales Sanatorium, near Denbigh.—First Asst. Res. M.O. £400.
Evelina Hospital for Children, Southwark, S.E.—Hon. P. to Out-patients. Also H.P. £160.
Hôpital Français, 172, *Shaftesbury-avenue, W.C.*—Second Res. M.O. £100.
King's College Hospital, Denmark Hill, S.E.—Clin. Assts. Med. and Surg. O's. Med. Sambrooke Reg.
Leeds General Infirmary.—Orthop. H.S.
Leicester Royal Infirmary.—H.P. £200.
Lincoln County of the Parts of Lindsey.—Asst. M.O. £550.
London Homœopathic Hospital, Great Ormond-street, W.C.—Pathologist. £200.
London Lock Hospital, 91, *Dean-street, W.*—Hon. S. to Out-patients.
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Manchester Royal Infirmary.—Asst. Surg. O. £75. Anæsth. £50.
Middlesbrough, North Ormesby Hospital.—Asst. H.S. £150.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £200.
Nottingham General Hospital.—Res. Cas. O. £250.
Paddington Green Children's Hospital, W.—Phys. to Out-patients. Also Radiologist.
Pietermaritzburg, S. Africa, Grey's Hospital.—H.S. £400.
Preston Union.—Res. M.O. £100.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Asst. Res. M.O. £80.
Queen Mary's Hospital for the East End, E.—Hon. Asst. S.
Royal Dental Hospital of London, 32, *Leicester-square, W.C.*—Hon. Radiologist.
Royal Free Hospital, Gray's Inn-road, W.C.—Surg. Reg. £250.
St. Helens Hospital, Lancashire.—Res. M.O. £250.
Sudan Government Medical Department.—Med. Inspector. £E.660.
Warrington, Lancashire County Asylum, Winwick.—Asst. M.O. £300.
West Bromwich and District Hospital.—Res. Asst. H.S. £180.

The Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Mauchline (Ayr).

Births, Marriages, and Deaths.

BIRTHS.

BULL.—On Oct. 21st, at Springfield-road, Kingston-on-Thames, the wife of L. J. Forman Bull, M.B., of a son.
DICKINSON.—On Oct. 23rd, at Benton (Newcastle-upon-Tyne), the wife of W. H. Dickinson, O.B.E., M.R.C.P. Edin.—a daughter.
EDEN.—On Oct. 22nd, at a nursing home in Edgbaston, the wife of Geoffrey Eden, M.D., M.R.C.P., of a daughter.
FICKLING.—On Oct. 17th, at Barnes, Eileen, the wife of E. L. Fickling, M.R.C.S., L.R.C.P., L.D.S., of a son.
HUMPHRY.—On Oct. 18th, at Don-road, St. Helier, Jersey, the wife of Dr. A. Murchison Humphry, of a daughter.
JAMES.—On Oct. 14th, at Clay Point, Flushing, Falmouth, the wife of Major J. F. James, I.M.S., of a son.
REES.—On Oct. 17th, at 29, Lower Seymour-street, to Dr. and Mrs. J. R. Rees (née Hemingway)—a daughter.
SANDILAND.—On Oct. 16th, at The Warren, Lenham, Kent, the wife (née Pine) of Dr. E. L. Sandiland, of a son.

MARRIAGES.

CAM—JAMIESON.—On Oct. 19th, at Paulerspury, Walter Holcroft Cam, M.B., B.Ch., to Ruth, widow of Major Gerald Jamieson, Indian Army.
GORDON—COX.—On Oct. 18th, at St. Michael's Church, Elie, Captain S. Gordon, M.C., I.M.S., to Elsie, second daughter of Mr. and Mrs. B. C. Cox, Largo House, Largo.

DEATHS.

EVANS.—On Oct. 21st, at 121, Harley-street, London, W. 1, Charles Hotham Evans, F.R.C.S., late Captain R.A.M.C., fourth son of the late Evan Evans, M.D., R.N.
GALLOWAY.—On Oct. 18th, at a nursing home, Sir James Galloway, K.B.E., C.B., M.D., F.R.C.P., aged 60 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE RELATION OF ALCOHOL TO VENEREAL DISEASE.*

BY L. W. HARRISON, D.S.O., M.B., CH.B. GLASG.,
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I PROPOSE to deal first with the part played by alcohol in the ætiology of venereal disease, and then with its effects on the venereal patient. There are good theoretical reasons for the almost unanimously held belief that indulgence in alcohol contributes materially to those factors which, through illicit sexual intercourse, make for the contraction of venereal disease. Broadly speaking, there are two ways in which alcohol promotes illicit intercourse, by its action on the brain, and by irritating nerve endings in the genito-urinary passages. As to the effect of alcohol on the brain sexual instinct, like other emotions, depends on nerve centres which are of a comparatively low order. The impulse of the sexual instinct centres to sexual gratification is controlled by the higher nerve centres on which depend judgment, self-criticism, and those attributes which distinguish man from the lower animals. Presumably when the sexual instinct centres are stimulated in one or more of the many ways by which sexual desire is aroused, gratification of that desire depends on the resultant of two opposing forces, that of the impulse to satisfy the sexual desire, and that of the inhibitory impulse descending from the higher centres—its strength—and depending on the judgment of those centres forbidding satisfaction. Assuming that the occasion is one where the gratification of sexual desire would, according to our code, be illicit, the higher judgment centres would be influenced in the direction of inhibition by various considerations, the result of stimuli from other centres of a high order which are the product of moral and social training, perhaps memory of warnings by others of the dangers of illicit sexual intercourse, and perhaps also an inborn sense which is revolted by the idea of sexual gratification on a commercial basis, a sense which is well worth cultivating in young subjects. It is agreed that alcohol is a narcotic which progressively dissociates the nerve centres by obstructing the paths along which they communicate with one another, and that as the dose of alcohol is increased the order in which the dissociation proceeds is from above downwards, the paths from the higher centres being the first to suffer and later those from the lower and more strongly developed. Thus the first effect is to release control over the emotions by cutting out the inhibitory impulse from centres of judgment and as the dose is increased to cut out the emotions. If this is accepted, it will be understood that the danger of illicit sexual intercourse is in the lower ranges of alcoholism and in those with poorly developed judgment centres; I think that this accords with experience. Another effect of alcohol must also be mentioned—its stimulating effect on the sexual centres by irritation of nerve endings in the genito-urinary passages. Irritation of the genito-urinary passages stimulates the sexual centres, as is shown by the frequent erections which accompany an attack of gonorrhœa, and the irritant effect of alcoholic drinks on the passages is demonstrated by the increased discharge which follows its administration in most cases of urethritis. E. Finger supposes that alcohol predisposes to the contraction of venereal disease by prolonging the sexual act and by exciting its frequent repetition on the same occasion, so increasing the length of time during which the parts are in contact with infective material. Amongst other effects of alcohol contributing to the contraction of venereal disease may also be mentioned the resulting failure to take any steps to remove the contagion, and perhaps I may add the possibility that alcohol lowers the resistance of the tissues to disease.

Literature of the Subject.

So much for theoretical considerations. It may be worth while to see how these are borne out by experience. There is a strong uniformity of opinion amongst those interested in venereal diseases that indulgence in alcohol is an important predisposer to the contraction of venereal disease. I have not troubled to discover the earliest record of the opinion that the two are closely associated, but my casual reading has taken me back to an entertaining essay on venereal disease by Joseph Addison, which was published in the *Tatler* of Dec. 7th, 1710, where this passage appears: "Many are the opinions of learned men concerning the rise of that fatal distemper which has always taken a particular

* Abstracted from an address delivered to the Society for the Study of Inebriety on Oct. 10th, 1922.

pleasure in venting its spite upon the nose." The essayist is here, of course, referring to syphilis, which in those days much more than now resulted in destruction of the nose. The passage continues: "I have seen a little burlesque poem in Italia that gives a very pleasant account of this matter. The fable of it runs thus: Mars, the god of war, having served during the siege of Naples in the shape of a French colonel, received a visit one night from Venus, the goddess of love, who had always been his professed mistress and admirer. The poem says, she came to him in the disguise of a suttling wench with a bottle of brandy under her arm."

In recent times we find in all the measures undertaken by official bodies to combat venereal disease that restriction of the drink traffic to the lowest limits always occupies a prominent place in the campaign. I would instance here the measures taken by the American army in France, which you will find described in articles by Dr. Hugh Young, J. E. Moore, and P. M. Ashburn in various numbers of the *Journal of the American Medical Association* in 1919 and 1920. In our own army the great reduction in the incidence of venereal disease which took place from 1884 to 1913 has been attributed to increasing temperance of the troops amongst other causes. On the civilian side I would refer you to a paper entitled Commercialised Prostitution and the Liquor Traffic, by G. J. Kneeland, which appeared in *Social Hygiene* for January, 1916. Kneeland showed that the sale of liquor in brothels acted primarily as an attraction to customers and next in weakening their resistance to temptation.

Inconclusive Statistics.

A number of workers have collected statistics pointing to the fact that a jollification when more than the customary dose of alcohol was consumed was the ruling circumstance which led to the contraction of venereal disease by most of their patients. During the war I made an inquiry at Rochester Row Military Hospital, and my figures were supplemented by others collected by Captain W. Craig at the Lichfield Military (V.D.) Hospital. Of 1256 patients questioned the statements made were as follows:—

122	(approximately 10%)	were	drunk,
223	(,, 17%)	,,	jolly,
599	(,, 47%)	,,	perfectly sober,
312	(,, 24%)	,,	total abstainers,

at the time of infection.

Out of these figures we get 27 per cent. certainly under the influence of alcohol. Out of the remainder we have 47 per cent. who claimed to have been perfectly sober, but I think, myself, that a claim to have been perfectly sober does not exclude the influence of alcohol, since a man may be perfectly sober in his own estimation though he has consumed an amount of alcohol which is rather over his customary dose.

Problem of Total Abstinence.

Personally I am inclined to think that the sexual desire begins to increase at the point where the customary dose of alcohol is exceeded, and that it is in the lower ranges of alcoholism that there is active search for sexual gratification, while the totally drunk person's sexual indulgence is an accident due to his having been led to it passively by others or another. I am unable to account satisfactorily for the percentage of total abstainers, in which Captain Craig's and my own figures agreed fairly closely. I do not know what is the proportion of total abstainers in the same age group and class of the general population as our infected soldiers, but it does not seem likely that it is greater than 20 per cent., and if this is so our figures do not make a strong case for total abstinence as a protection against venereal disease. I suggest that possibly the total abstainers may seek sexual gratification as a relief from the monotony of things when a moderate drinker would be content with his customary dose of alcohol.

Generally our statistics as they stand do not make a strong indictment against alcohol as a factor in the contraction of venereal diseases. At the same time they do not vindicate alcohol, and I prefer to rely on my own impression, which agrees with those of almost all writers, in concluding that, other things being equal, if the consumption of alcohol ceased the incidence of venereal disease would be reduced.

The Effect of Alcohol on the Sufferer from Venereal Disease.

In gonorrhœa it is well known that alcohol causes an increase of symptoms, and it is customary to forbid it in any form until the urethritis has practically gone. It is a common practice to test the patient for cure by getting him to take alcohol in some form, since in patients who are not cured this will light up the disease afresh. What effect it has on the patient's resistance to the germ of gonorrhœa I am unable to say. It would be valuable if its effect on resistance could be determined scientifically, since without a sufficient resistance we may do what we will in the way of local treatment, but we will not cure gonorrhœa. Generally my impression is that total abstainers recover more quickly, but I have no figures to prove it.

The case of syphilis requires rather longer discussion since, as far as I know, there are no statistical data which demonstrate accurately the effect of alcohol on the course of this disease, and I must try to argue largely on theoretical considerations. There is evidence to indicate that, almost from the first, the tissues build up a strong resistance to the virus of syphilis. This is shown by the fact that, after a comparatively few days, until he is cured or practically cured, the patient cannot be reinoculated by ordinary means at any rate. Also the recent experiments by Eberson (*Arch. Derm. and Syph.*, October, 1921) showed that when the blood serum of old syphilitics was mixed with the virus of syphilis and inoculated into rabbits no infection resulted, though the same virus injected without previous admixture with the serum in question always infected the rabbit. A further indication of the resistance put up by the tissues is the long periods of latency which often follow the secondary stage. This is usually attributed to the dormancy of the parasite, but I think it would be more correct to ascribe it to the supremacy of the tissues over the parasite, since late recurrences of syphilis occur so very frequently in parts of the body which have recently been damaged or overstrained that one pictures the germ of syphilis as an enemy lying low always on the watch to catch the tissues at a disadvantage. The tendency of syphilis to break out afresh in the damaged spot has always interested me, and I could relate scores of cases in illustration. For example, a patient of mine had run a thorn into his hand. He had been infected with syphilis many years previously, but had seen no signs for a long time; from the site of the thorn puncture a serpiginous tertiary syphilide gradually spread over the whole palm. An old syphilitic showed the signs of a superficial tertiary syphilide in the upper and inner side of his thigh; a fragment of shell had struck him on that spot about a fortnight before the syphilide appeared; the blow had been so light that the skin was not broken and barely bruised. The conviction that the tissues can often hold their own against the germ of syphilis if not handicapped always reminds me to advise my syphilitic patient of the enormous importance of keeping in the pink of condition, since thereby his own tissues will contribute materially to the victory over the parasite.

Alcohol as a Predisposing Factor.

In the light of experience of the effect of topical damage such as trauma in lowering the resistance of the affected tissues to the parasite of syphilis, it is to be expected that when alcohol is taken by a syphilitic in sufficient amounts to damage the tissues the disease would make its presence manifest in those parts of the body which are injuriously affected by alcohol. But when we attempt to discover how far this preconception is borne out by experience we are faced with many difficulties. For example, alcohol affects the brain, the peripheral nerves, and the liver, so that one might expect general paresis, syphilitic neuritis, and gummatous hepatitis to be more common in syphilitics who are alcoholics than in those who are abstainers, but statistical proof that such is the case is a very difficult matter. It is true that a large number of general paretics have an alcoholic history, but their weakness in this respect might have been inborn or might have been due to the disease. In cirrhosis of the liver the proportion of cases in which coexistent syphilis is proved by the blood test is a notable one, but syphilitic cirrhosis is difficult to distinguish from alcoholic, and which factor predominated in the ætiology of a given case cannot, as far as I know, be determined. Syphilitic neuritis is, in my experience, very uncommon. Alcohol in certain forms, at any rate, irritates the mucous membrane of the mouth and stomach, and superficial glossitis with leucoplakia of the tongue and cheeks is a well-known late effect of syphilis. One would expect it to be more common in spirit-drinkers than in those who prefer beer, but I am not able to give any exact figures on this point. In my experience leucoplakia is more common in men, and I have the impression that it occurs more frequently in spirit-drinkers, but it is difficult to dispose of the frequently concomitant factors of tobacco smoke and condiments, one or both of which I have found prominent in moderate beer-drinkers and total abstainers suffering from leucoplakia, and therefore to be considered as also predisposing to this manifestation of syphilis. I do not remember, however, to have seen a case of leucoplakia in which there was no irritant factor such as alcohol, tobacco, or condiments, and I think it can safely be said that, in so far as alcohol irritates the mucous membrane of the mouth, it predisposes the syphilitic to superficial glossitis and leucoplakia. After treading so uncertainly, I fear to go on to the cardio-vascular system, but I may perhaps remind you that syphilis is, above all, a disease of arteries, and many of its most tragic effects, such as aneurysm, syphilitic myocarditis, and thrombosis of cerebral and spinal vessels arise from this cause. The predisposing effect of alcohol to these manifestations of syphilis can only be surmised from the principle I have

already enunciated, that syphilis makes most havoc in those tissues which are damaged by other causes. Still another effect of alcohol on which it is possible only to speculate in regard to its rôle as an ally of the germ of syphilis is depression of general metabolism and lowering of resistance to microbial invasion. How far alcohol predisposes to intolerance of antisyphilitic remedies I do not know. One troublesome, though relatively uncommon, effect of the arsenobenzol preparations which are now so commonly used in the treatment of syphilis is jaundice, and Foulerton in particular has recommended the exclusion of alcohol as a measure of precaution against this complication.

Altogether, in regard to the effect of alcohol on the syphilitic, although I have produced no very positive evidence, I think I am justified in believing, on general principles, that there is much in the saying of a syphilologist of wide experience that "if you want to preserve the germ of syphilis, do it in alcohol."

VIRUS DISEASES IN PLANTS, ANIMALS, AND MAN.

AT a meeting of the Association of Economic Biologists held on Oct. 13th, Prof. E. B. Poulton, President, in the chair, Dr. E. J. Butler said that the first demonstration that disease can be caused by a filtrable virus was by Iwanowski in 1892 in mosaic disease of tobacco. Mosaic disease is now known in nearly 100 species of plants. Diseases like peach-yellows and others characterised by phloem-necrosis are probably caused by similar agents though the filtered juice is not infective. All diseases hitherto tested can be transmitted by grafting, most of them by insects (the chief method in nature), and many by inoculating with sap. Mere contact will not cause infection. Infection may be hereditary in the insect transmitter and in the plant, though carriers are known. The causal agents are believed to be living organisms. Several investigators have recently found large amœbiform corpuscles or smaller granules in infected cells. The former have been compared with cytorrhyctes or neurorrhyctes, the latter with chlamydozoa, but a resemblance to rickettsia is suggested. The causal organisms appear to be obligate parasites.—Dr. J. A. Arkwright said that the chief points of interest common to plant and animal "virus diseases" are: (1) the nature and properties of the virus; (2) the means of transmission—e.g., carriers and insect vectors; (3) measures for prevention—e.g., breeding or selection, and isolation or destruction; (4) perhaps the concentration of the virus in certain special tissue cells. Forty-eight or fifty animal virus diseases have been described which may be roughly classified as follows: (1) visible, not filtrable, not cultivated—e.g., rickettsia; (2) probably visible, filtrable, cultivated—e.g., pleuropneumonia of cattle, poliomyelitis; (3) filtrable, not cultivated, some (?) visible in the tissues—e.g., foot-and-mouth disease, vaccinia; (4) filtrable, very resistant—e.g., infectious anæmia of horses, fowl-pox. In general properties most of the viruses do not differ much from bacteria, though some show great resistance to drying, glycerine, and heat. The smallest clearly visible and the largest filtrable particles are of the same order of size—i.e., about 0·2 micron. Living organisms may conceivably be much smaller than this. The differentiation of colloidal particles of about 0·2 micron in size by means of the microscope is often extremely difficult and requires attention, especially to their arrangement and their range of size and shape, rather than to the appearance of individual particles. Dr. Arkwright said that it seems theoretically possible though perhaps quite unnecessary to conceive that an enzyme might be the cause of an infectious disease on the analogy of Twort's lytic substance and the bacteriophage of d'Herelle.

PUBLIC PROPAGANDA AGAINST CANCER.

THE American Society for the Control of Cancer announces that Nov. 12th–18th has been set apart as cancer week throughout the American continent. In THE LANCET of Sept. 23rd we described the manifesto and leaflet, issued to the public during the summer by the Leicester Health Committee, relating to the significance of certain early symptoms of cancer, and to the importance of seeking medical advice immediately such symptoms appear. This was, of course, not the first publication of the kind. A leaflet of very similar import was issued by the Portsmouth Health Department in January, 1914, as a "special notice to the public." It was signed by Dr. A. Mearns Fraser, medical officer of health, and set out briefly and pointedly the signs and symptoms which should cause a man or woman to seek skilled advice. The opening paragraph runs as follows: "It has been brought to the notice of the Health Committee that of the number of persons who die each year from cancer many could have been cured if they had applied earlier for medical advice. On questioning patients as to why they did not apply to a doctor earlier, the reason almost invariably given is that as the early symptoms were unaccompanied by pain, it was not thought that anything serious was the matter." In regard to the question of infection the Portsmouth leaflet concluded: "Although there is no evidence that cancer is communicable under ordinary circumstances, it is desirable that rooms occupied by a person suffering from cancer should be cleaned and disinfected from time to time." Another leaflet, issued by the Metropolitan Borough of Holborn, opens with the statement: "Cancer is one of the great causes of death of middle age and later life; at least one-tenth of the deaths over 45 are the result of cancer. Many of these people if they had gone to a doctor in good time could have been cured. The only cure for cancer known at present is its early and complete removal by operation. If neglected and not removed in its early stage the disease is nearly always fatal."

PUBLIC HEALTH IN BRITISH HONDURAS.

Lieut.-Colonel Max Smith, in his report on the Colony for the year 1920, gives the estimated total population as 45,083. The birth-rate worked out at 45·03 per 1000 of the population, as compared with 41·25 per 1000 during 1919. The death-rate was 25·00 per 1000, a little lower than the normal. The principal causes of death in order of degree were from diseases of the digestive system followed by those of the respiratory system, and then by those classified under the genito-urinary system. Deaths from malaria gave a proportion of 11·3 per cent. of the total deaths, and tuberculosis accounted for 14·2 per cent. of all the deaths registered—a higher proportion than usual, but due to sequelæ of the influenza epidemic. At the end of 1920 the sanitation of Belize (the capital, which has a population of 12,660) was, from the point of view of malarial and yellow fever prevention, by no means as satisfactory as it should have been. The towns of Corozal, Orange Walk, Stann Creek, Cayo, and Punta Gorda are on the whole in a more satisfactory condition, chiefly owing to the fact that all of them are possessed of fairly good natural drainage, so that water soon runs off the streets and cots. The Anti-Hookworm Campaign, which was commenced in 1917, was concluded this year. The number of persons examined was 17,989, the number of positives 8076, and the number treated 7660. The climate of British Honduras has the reputation of being a very unhealthy one, but facts show that it compares not unfavourably with that of other tropical colonies with small European populations. Leaving out 1918, in which year there was an epidemic of influenza, the death-rate taken over a number of years approximates to 26 per 1000, and over one-fifth of this number of deaths occurs in children under 1 year of age, who more often than not die through the neglect of their parents and not on account of the climate. In 1890 the births numbered 1131, the marriages 355, and the deaths 1182, the corresponding totals in 1920 being 1983, 497, and 1101 respectively. In these figures may be sought and perhaps found a reason for the prevalent idea outside the Colony that British Honduras is very unhealthy. Thirty years ago the population was 30,000, and the death-rate nearly 40 per 1000; to-day the population is 45,000 and the death-rate is about 25 per 1000. The old saying, "Give a dog a bad name and hang him" applies to British Honduras, and those who live there wonder how many more years will elapse before the generality of people will realise that for Europeans leading a normal life and taking common precautions, the climate will be found salubrious, pleasant, and healthy. The mean maximun shade temperature is 90° F., the mean minimum 62°. Breezes from the sea prevail for the greater part of the year. The average rainfall is about 81 inches per annum. From the middle of February to the middle of May is the dry season. For the rest of the year rain falls every month, the heaviest rainfall being in the months of September, October, and November, during which months about one-third of the total rain occurs.

INCIDENCE OF VENEREAL DISEASE AMONG TROOPS IN INDIA.

IN our summary of the annual report of the Public Health Commissioner in India for 1920 (Sept. 16th, 1922) we regret an error (p. 644, first column, line 25 from foot) in the sentence referring to the relative incidence of venereal disease among Indian, as compared with British, troops. The sentence should read: "The total venereal admissions in the former amounted to 60·5 per 1000 in 1920, as compared with 65·1 in 1919; 49·9 in the quinquennium, 1915–19; and 14·8 in 1910–14." On p. 645, col. 1, under heading *Venereal Disease*, line 8, for admissions rose to "70·5" per 1000 read "60·5."

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2 2 0
	Six Months	1 1 0
	Three Months	0 10 6
ABROAD	One Year	2 10 0
	Six Months	1 5 0
	Three Months	0 12 6